FIG. 1

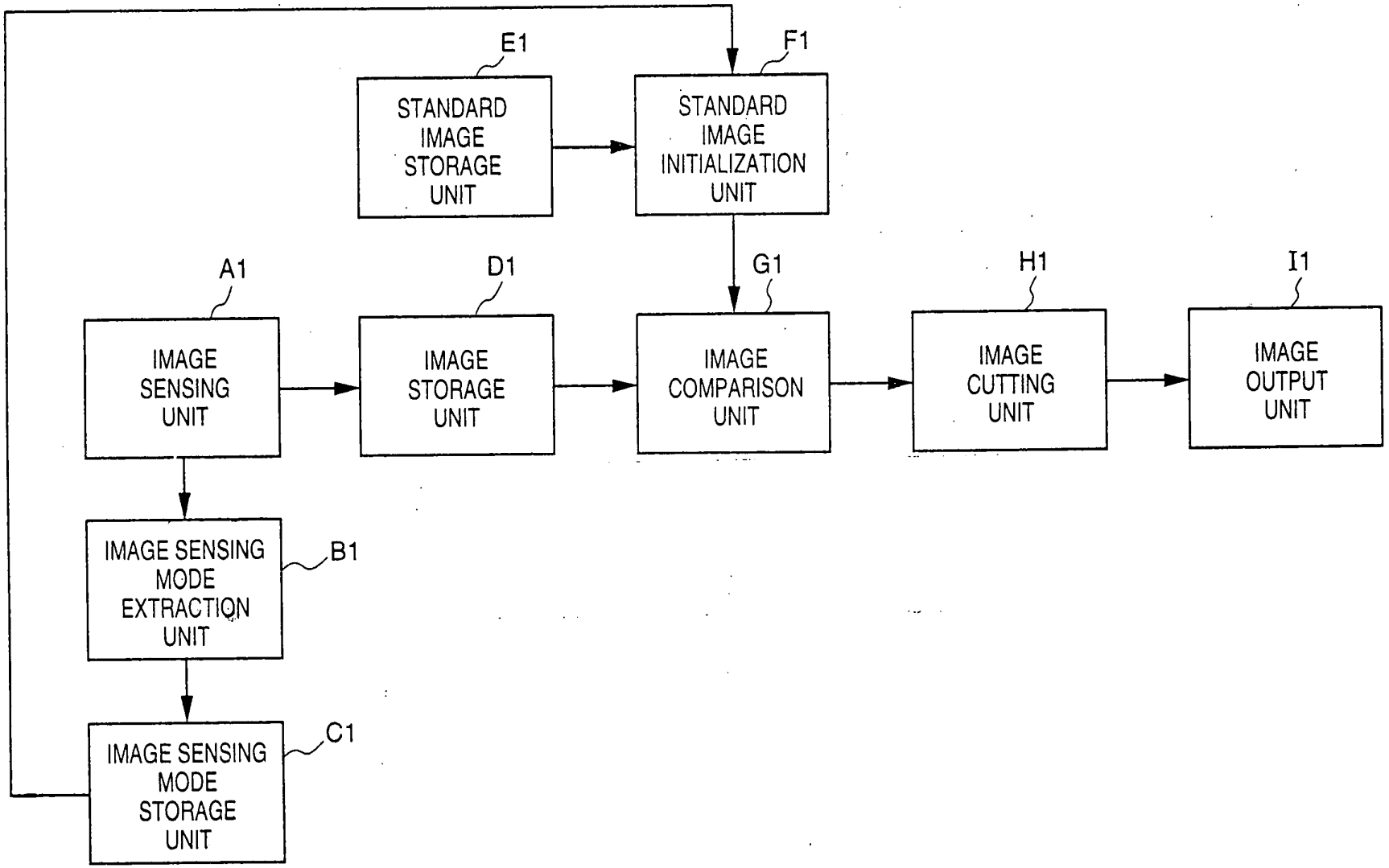

E1
F1
STANDARD IMAGE STORAGE UNIT
STANDARD IMAGE INITIALIZATION UNIT
A1
D1
G1
H1
I1
IMAGE SENSING UNIT
IMAGE STORAGE UNIT
IMAGE COMPARISON UNIT
IMAGE CUTTING UNIT
IMAGE OUTPUT UNIT
IMAGE SENSING MODE EXTRACTION UNIT
B1
IMAGE SENSING MODE STORAGE UNIT
C1

FIG. 2

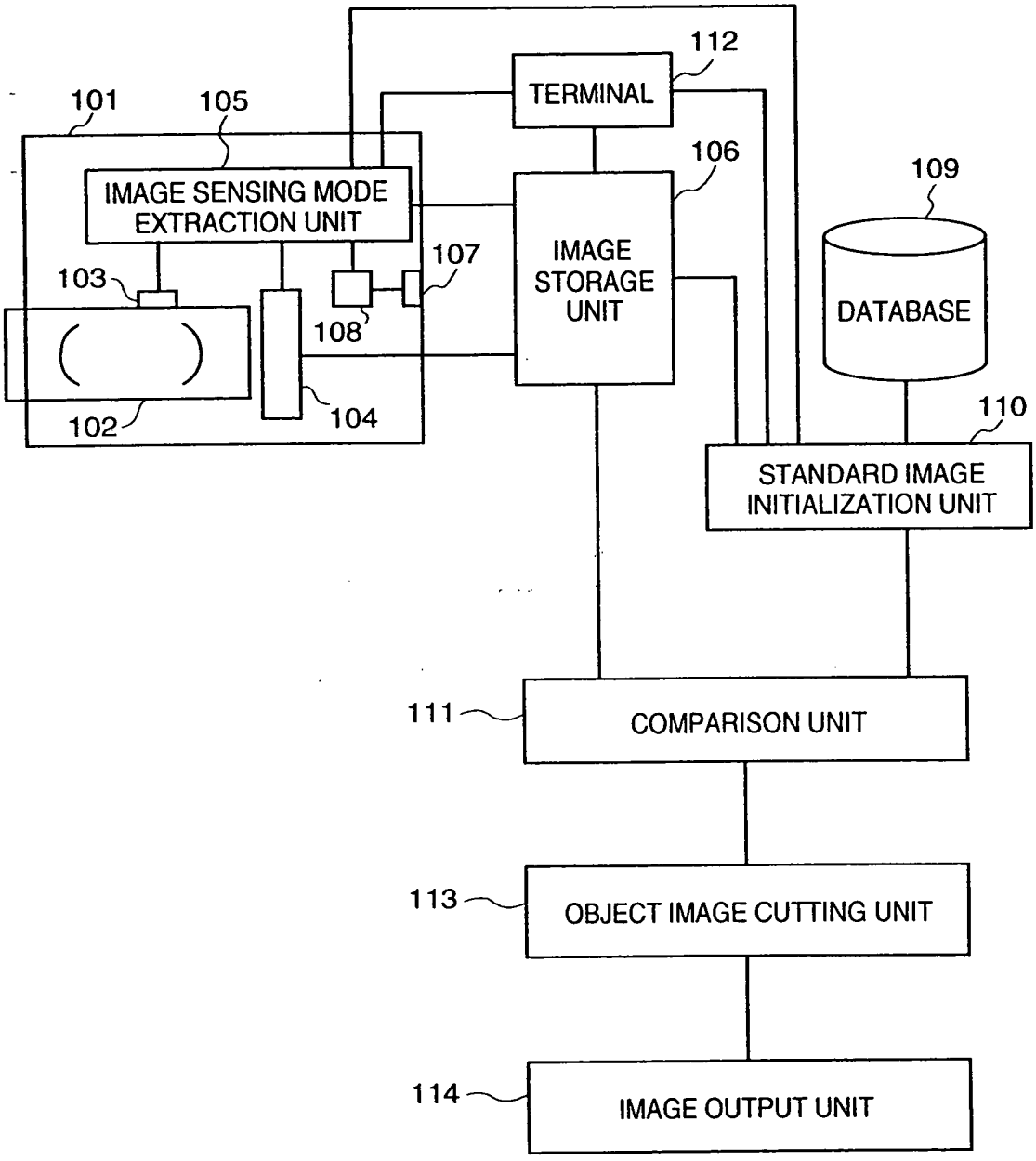

101
105
112
TERMINAL
IMAGE SENSING MODE EXTRACTION UNIT
106
109
IMAGE STORAGE UNIT
DATABASE
103
107
108
102
104
110
STANDARD IMAGE INITIALIZATION UNIT
111
COMPARISON UNIT
113
OBJECT IMAGE CUTTING UNIT
114
IMAGE OUTPUT UNIT

FIG. 3

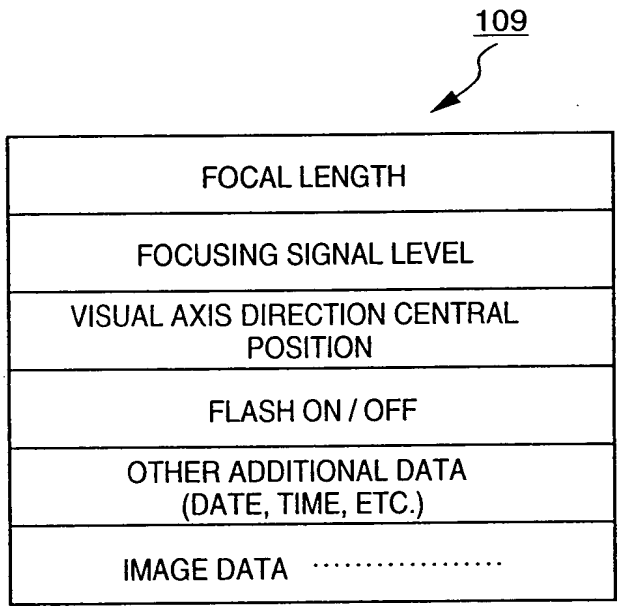

109
FOCAL LENGTH
FOCUSING SIGNAL LEVEL
VISUAL AXIS DIRECTION CENTRAL POSITION
FLASH ON / OFF
OTHER ADDITIONAL DATA (DATE, TIME, ETC.)
IMAGE DATA

FIG. 4

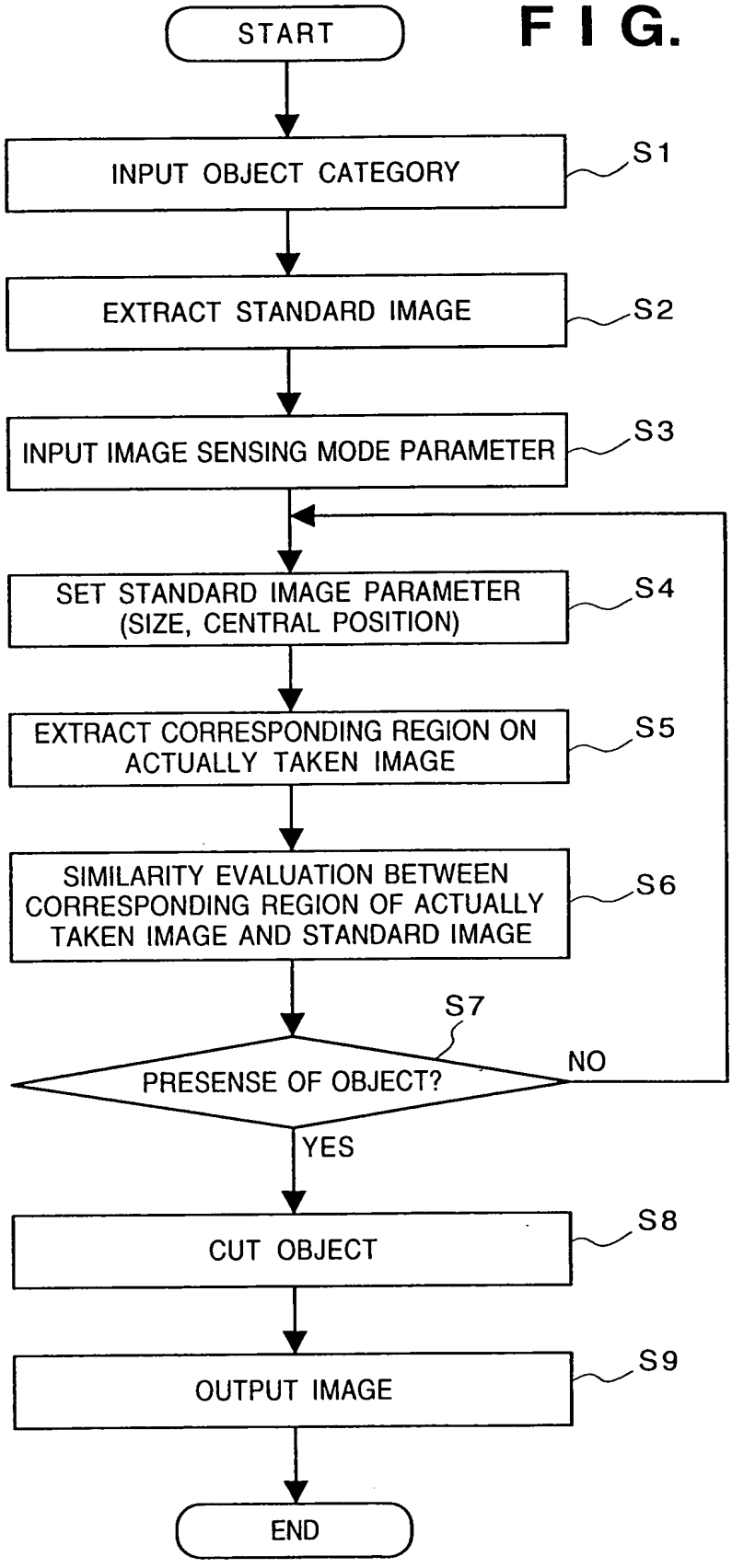

START
INPUT OBJECT CATEGORY
S1
EXTRACT STANDARD IMAGE
S2
INPUT IMAGE SENSING MODE PARAMETER
S3
SET STANDARD IMAGE PARAMETER (SIZE, CENTRAL POSITION)
S4
EXTRACT CORRESPONDING REGION ON ACTUALLY TAKEN IMAGE
S5
SIMILARITY EVALUATION BETWEEN CORRESPONDING REGION OF ACTUALLY TAKEN IMAGE AND STANDARD IMAGE
S6
S7
PRESENSE OF OBJECT?
NO
YES
CUT OBJECT
S8
OUTPUT IMAGE
S9
END

FIG. 5

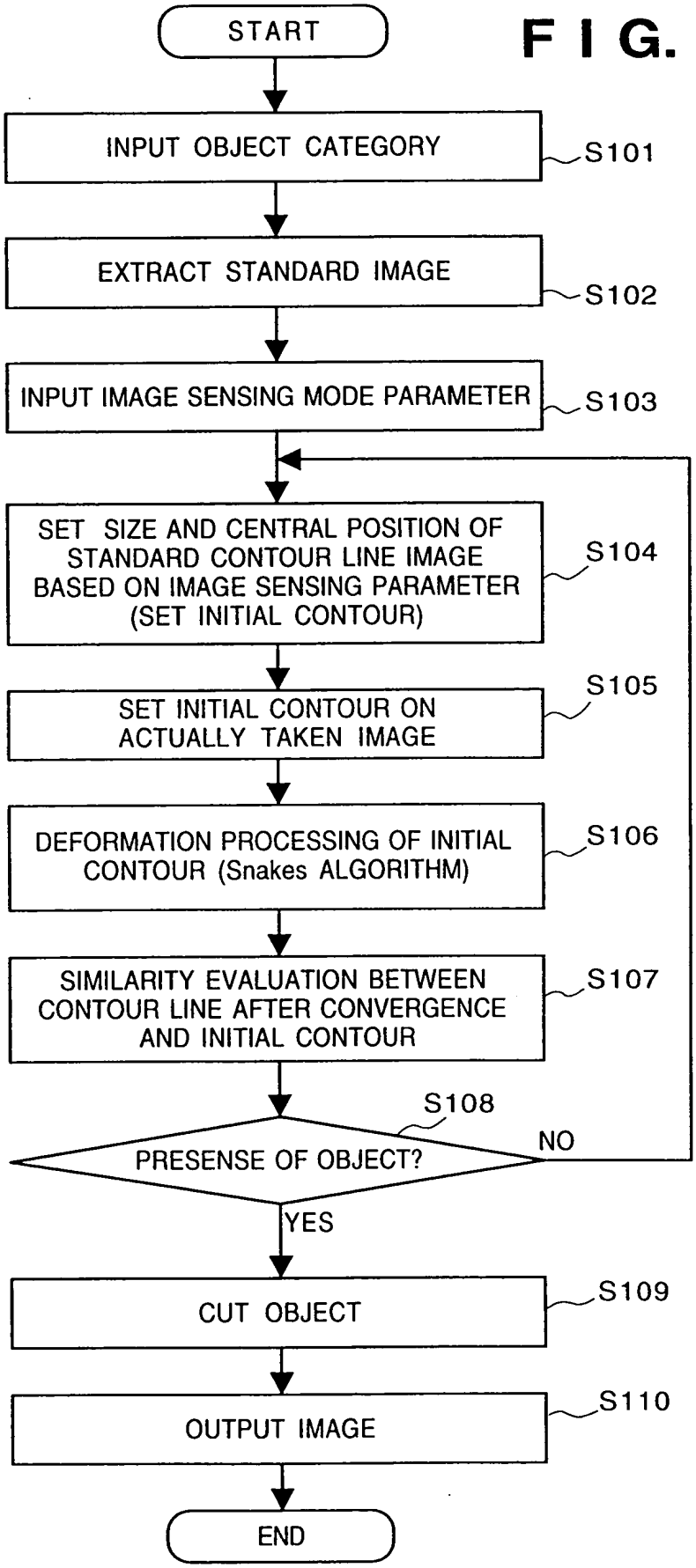

START
INPUT OBJECT CATEGORY
S101
EXTRACT STANDARD IMAGE
S102
INPUT IMAGE SENSING MODE PARAMETER
S103
SET SIZE AND CENTRAL POSITION OF STANDARD CONTOUR LINE IMAGE BASED ON IMAGE SENSING PARAMETER (SET INITIAL CONTOUR)
S104
SET INITIAL CONTOUR ON ACTUALLY TAKEN IMAGE
S105
DEFORMATION PROCESSING OF INITIAL CONTOUR (Snakes ALGORITHM)
S106
SIMILARITY EVALUATION BETWEEN CONTOUR LINE AFTER CONVERGENCE AND INITIAL CONTOUR
S107
S108
PRESENSE OF OBJECT?
NO
YES
CUT OBJECT
S109
OUTPUT IMAGE
S110
END

FIG. 6

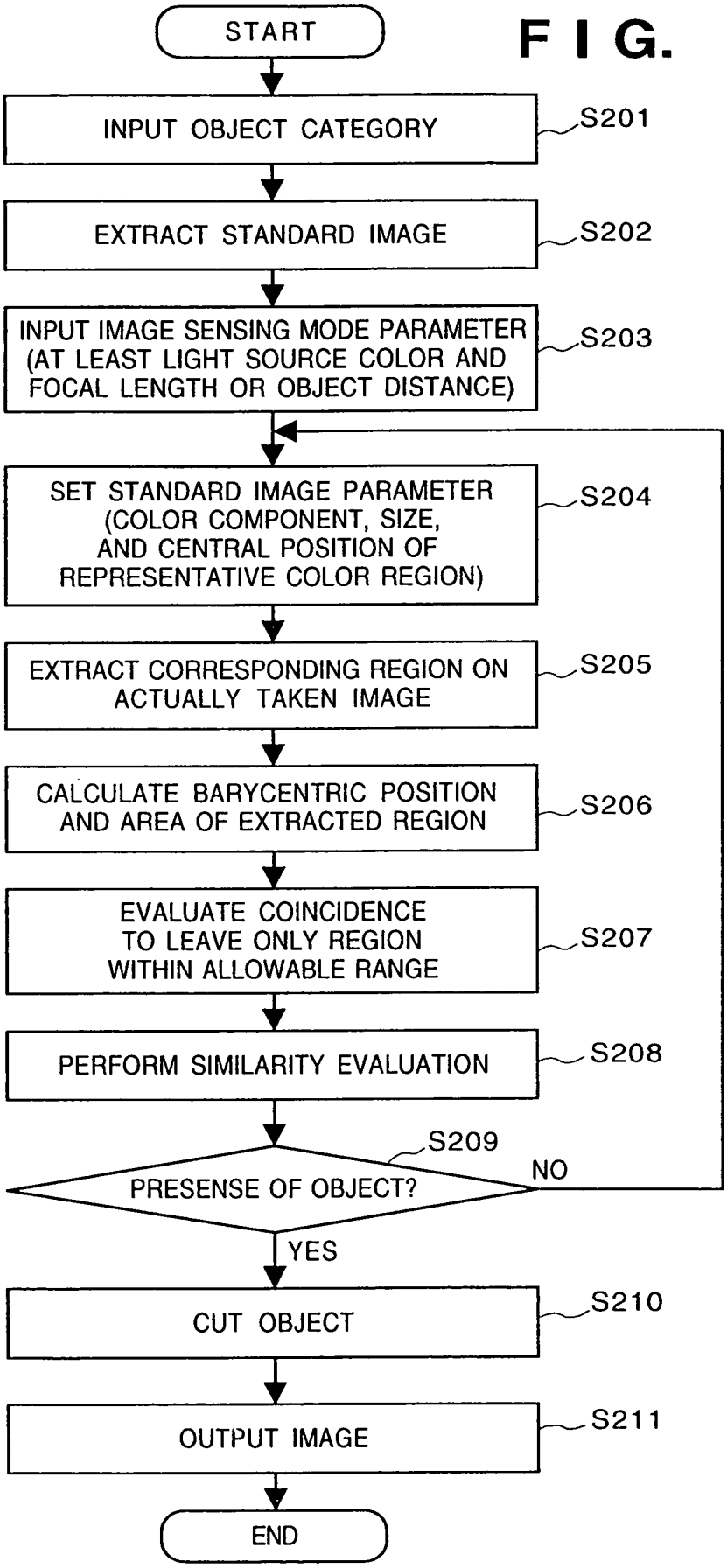

START
INPUT OBJECT CATEGORY
S201
EXTRACT STANDARD IMAGE
S202
INPUT IMAGE SENSING MODE PARAMETER (AT LEAST LIGHT SOURCE COLOR AND FOCAL LENGTH OR OBJECT DISTANCE)
S203
SET STANDARD IMAGE PARAMETER (COLOR COMPONENT, SIZE, AND CENTRAL POSITION OF REPRESENTATIVE COLOR REGION)
S204
EXTRACT CORRESPONDING REGION ON ACTUALLY TAKEN IMAGE
S205
CALCULATE BARYCENTRIC POSITION AND AREA OF EXTRACTED REGION
S206
EVALUATE COINCIDENCE TO LEAVE ONLY REGION WITHIN ALLOWABLE RANGE
S207
PERFORM SIMILARITY EVALUATION
S208
S209
PRESENSE OF OBJECT?
NO
YES
CUT OBJECT
S210
OUTPUT IMAGE
S211
END

FIG. 7

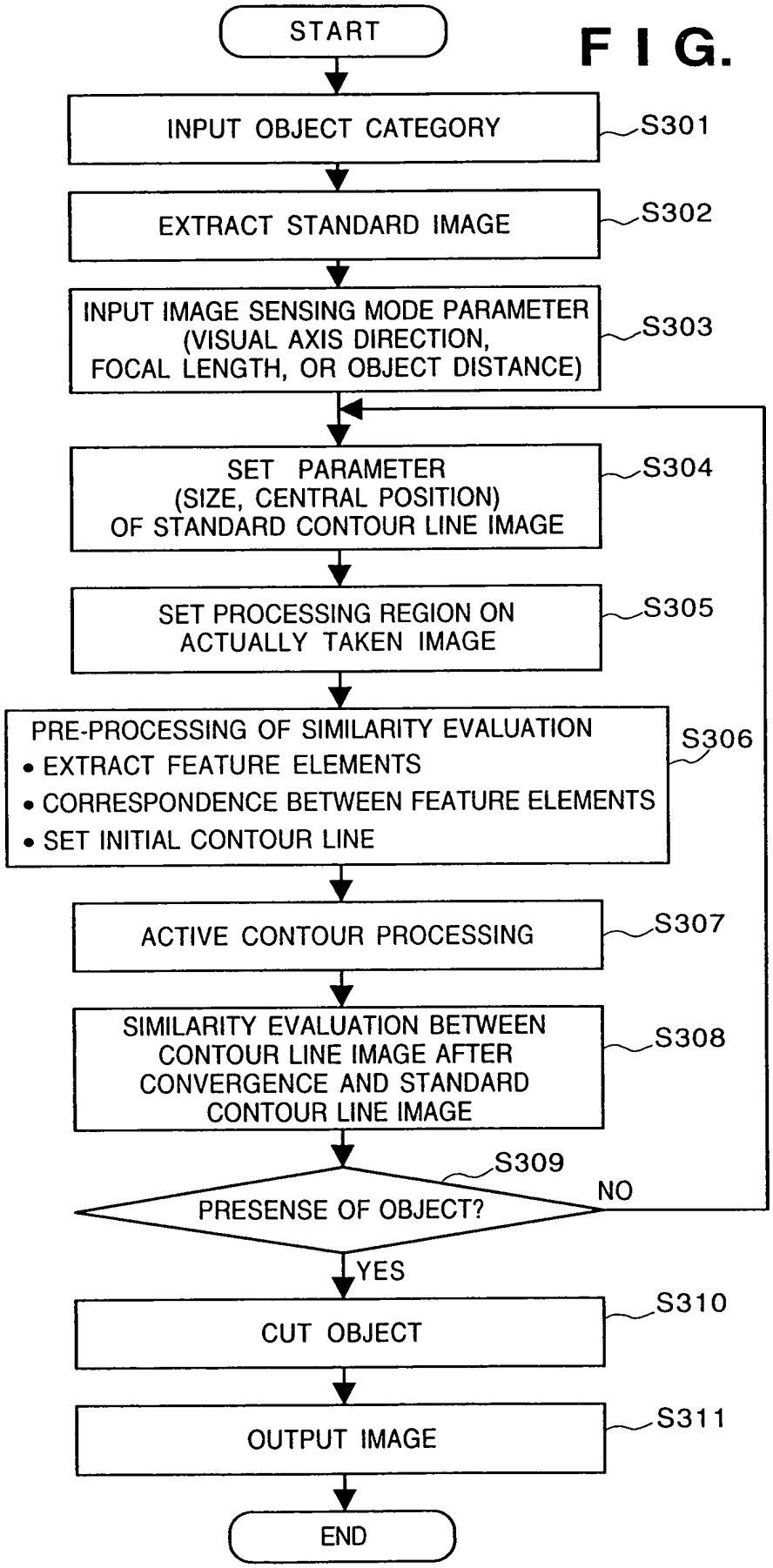
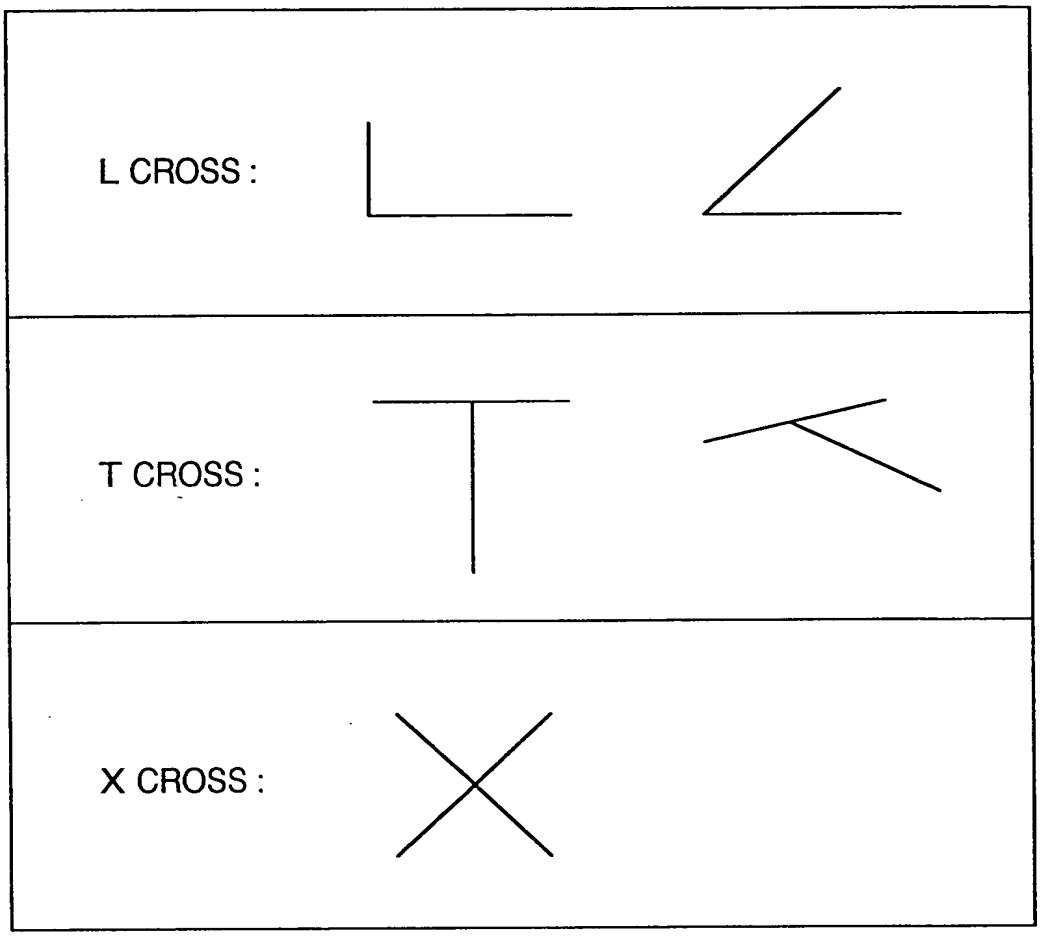

START
INPUT OBJECT CATEGORY
S301
EXTRACT STANDARD IMAGE
S302
INPUT IMAGE SENSING MODE PARAMETER (VISUAL AXIS DIRECTION, FOCAL LENGTH, OR OBJECT DISTANCE)
S303
SET PARAMETER (SIZE, CENTRAL POSITION) OF STANDARD CONTOUR LINE IMAGE
S304
SET PROCESSING REGION ON ACTUALLY TAKEN IMAGE
S305
PRE-PROCESSING OF SIMILARITY EVALUATION
• EXTRACT FEATURE ELEMENTS
• CORRESPONDENCE BETWEEN FEATURE ELEMENTS
• SET INITIAL CONTOUR LINE
S306
ACTIVE CONTOUR PROCESSING
S307
SIMILARITY EVALUATION BETWEEN CONTOUR LINE IMAGE AFTER CONVERGENCE AND STANDARD CONTOUR LINE IMAGE
S308
S309
PRESENSE OF OBJECT?
NO
YES
CUT OBJECT
S310
OUTPUT IMAGE
S311
END

FIG. 8



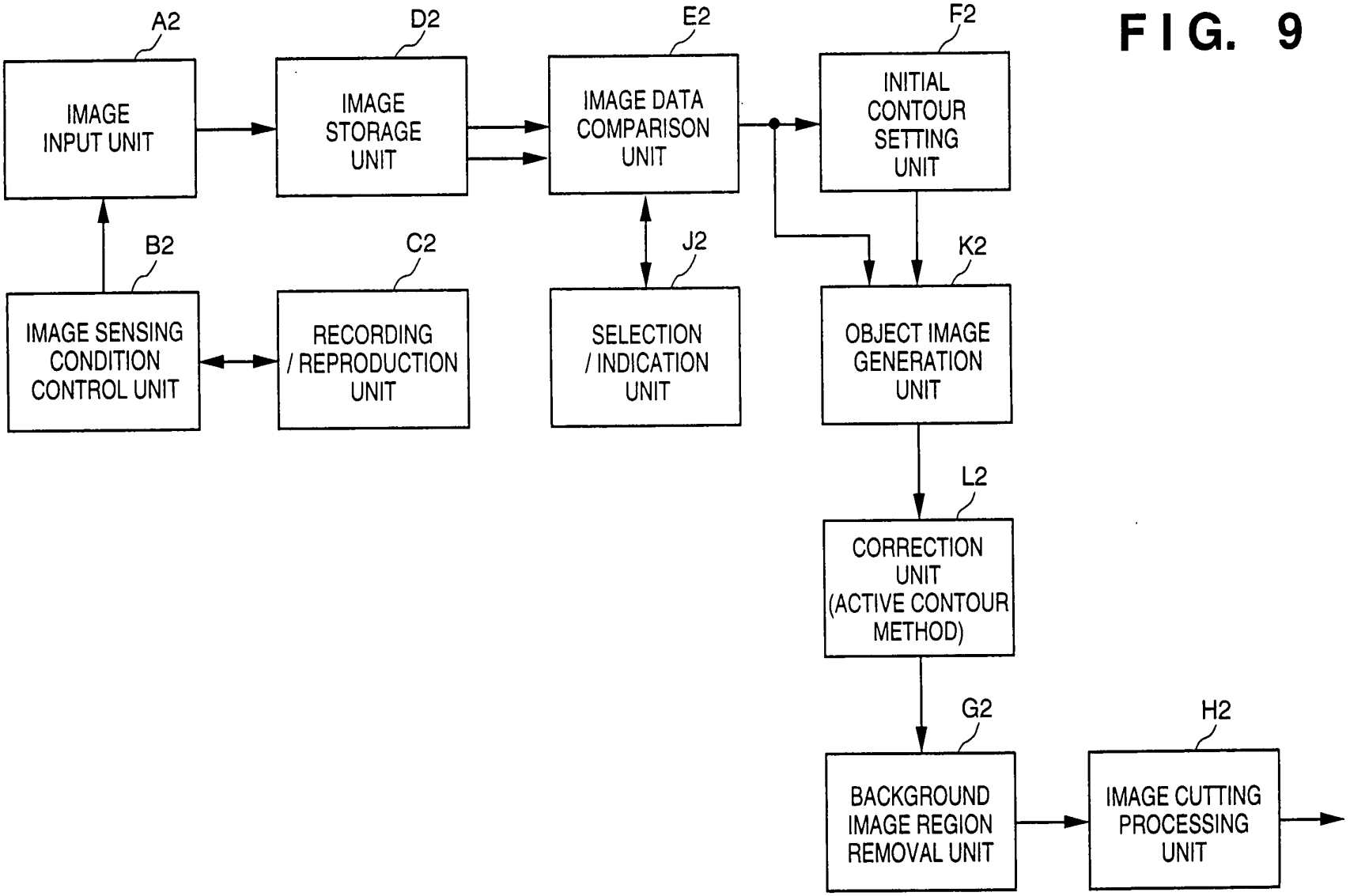

A2
IMAGE INPUT UNIT
D2
IMAGE STORAGE UNIT
E2
IMAGE DATA COMPARISON UNIT
F2
INITIAL CONTOUR SETTING UNIT
B2
IMAGE SENSING CONDITION CONTROL UNIT
C2
RECORDING / REPRODUCTION UNIT
J2
SELECTION / INDICATION UNIT
K2
OBJECT IMAGE GENERATION UNIT
L2
CORRECTION UNIT (ACTIVE CONTOUR METHOD)
G2
BACKGROUND IMAGE REGION REMOVAL UNIT
H2
IMAGE CUTTING PROCESSING UNIT

FIG. 9

FIG. 10

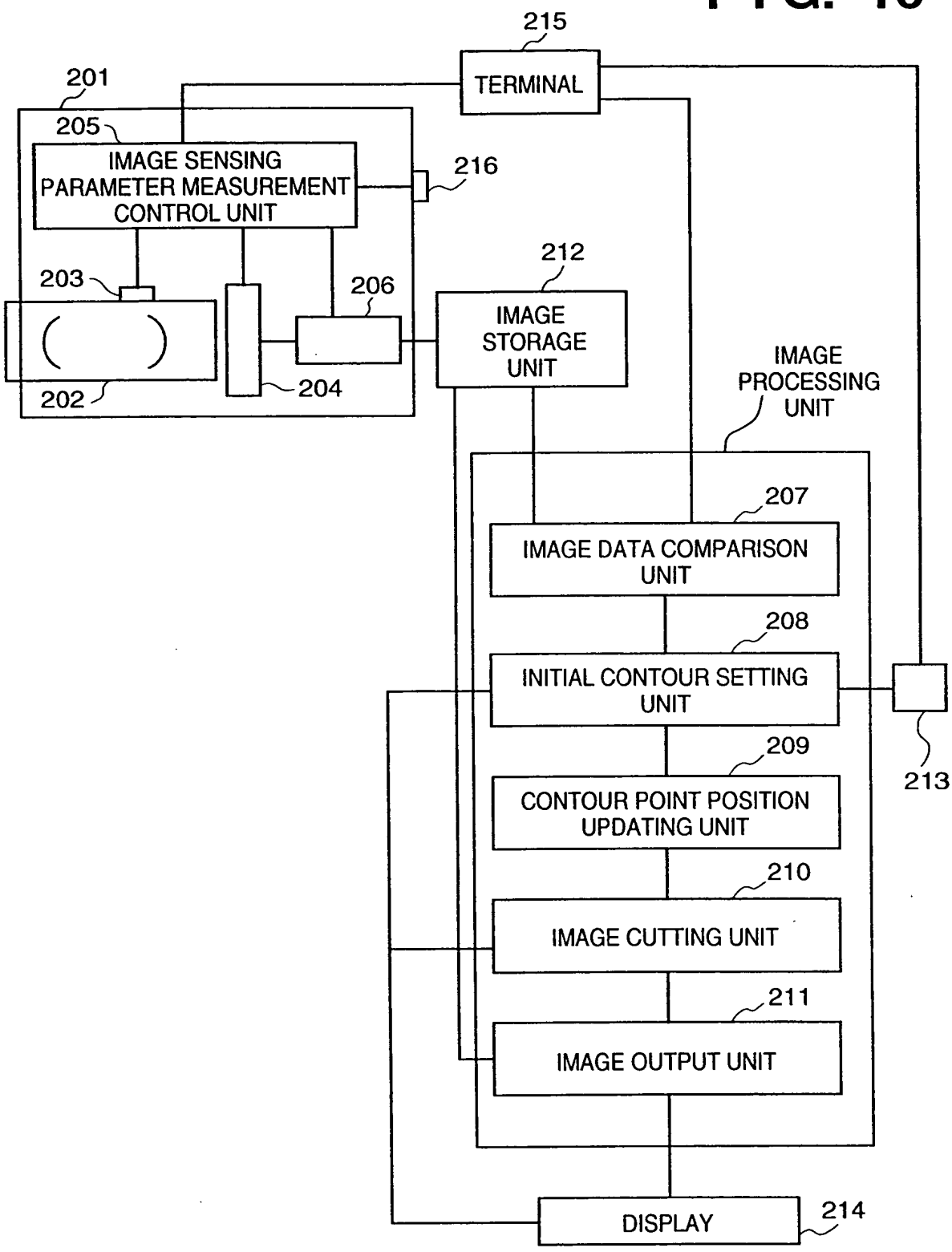

215
TERMINAL
201
205
IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
216
203
206
212
IMAGE STORAGE UNIT
202
204
IMAGE PROCESSING UNIT
207
IMAGE DATA COMPARISON UNIT
208
INITIAL CONTOUR SETTING UNIT
213
209
CONTOUR POINT POSITION UPDATING UNIT
210
IMAGE CUTTING UNIT
211
IMAGE OUTPUT UNIT
DISPLAY
214

FIG. 11

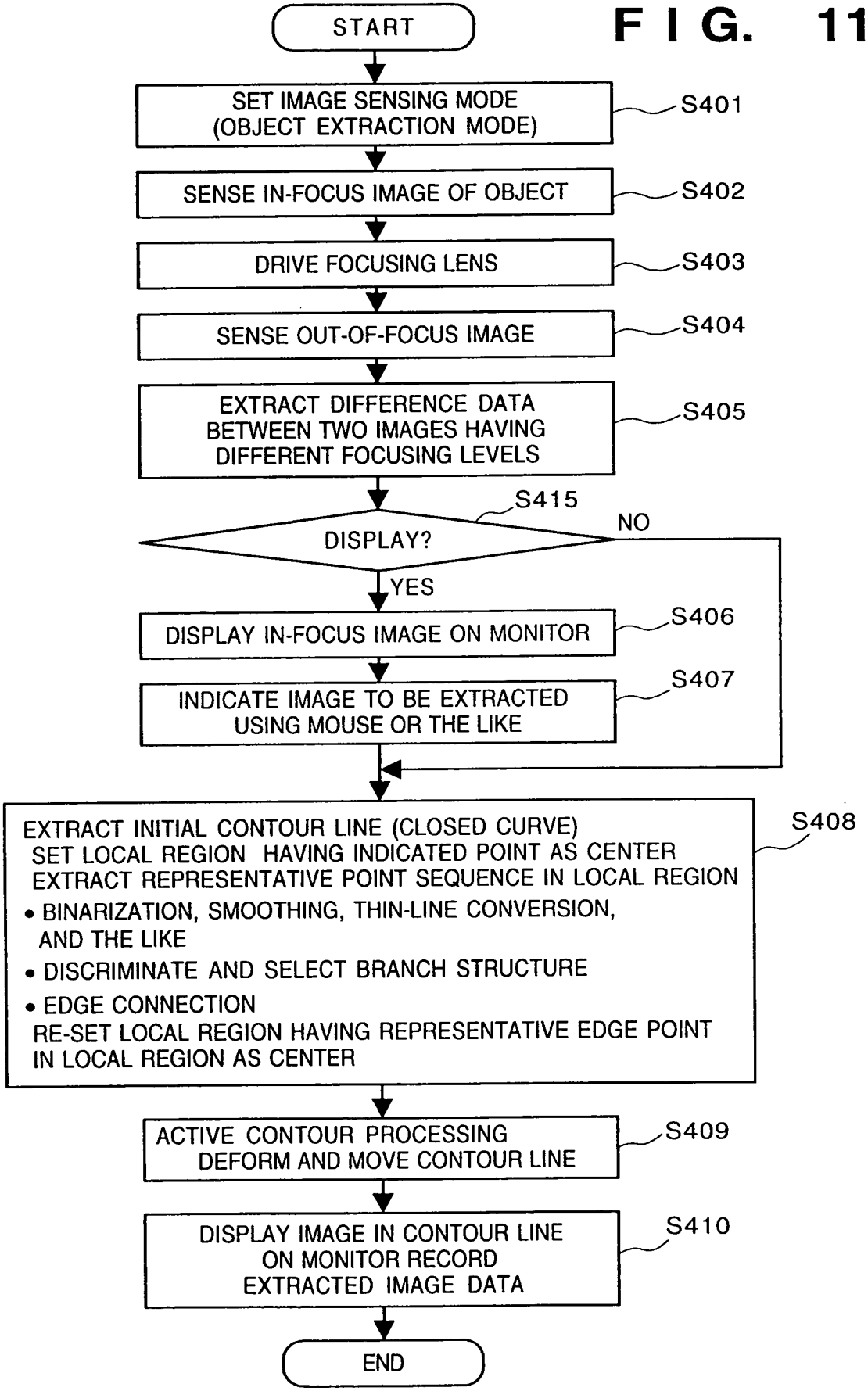

START
SET IMAGE SENSING MODE (OBJECT EXTRACTION MODE)
S401
SENSE IN-FOCUS IMAGE OF OBJECT
S402
DRIVE FOCUSING LENS
S403
SENSE OUT-OF-FOCUS IMAGE
S404
EXTRACT DIFFERENCE DATA BETWEEN TWO IMAGES HAVING DIFFERENT FOCUSING LEVELS
S405
S415
DISPLAY?
NO
YES
DISPLAY IN-FOCUS IMAGE ON MONITOR
S406
INDICATE IMAGE TO BE EXTRACTED USING MOUSE OR THE LIKE
S407
EXTRACT INITIAL CONTOUR LINE (CLOSED CURVE)
SET LOCAL REGION HAVING INDICATED POINT AS CENTER
EXTRACT REPRESENTATIVE POINT SEQUENCE IN LOCAL REGION
• BINARIZATION, SMOOTHING, THIN-LINE CONVERSION, AND THE LIKE
• DISCRIMINATE AND SELECT BRANCH STRUCTURE
• EDGE CONNECTION
RE-SET LOCAL REGION HAVING REPRESENTATIVE EDGE POINT IN LOCAL REGION AS CENTER
S408
ACTIVE CONTOUR PROCESSING
DEFORM AND MOVE CONTOUR LINE
S409
DISPLAY IMAGE IN CONTOUR LINE ON MONITOR RECORD EXTRACTED IMAGE DATA
S410
END

FIG. 12

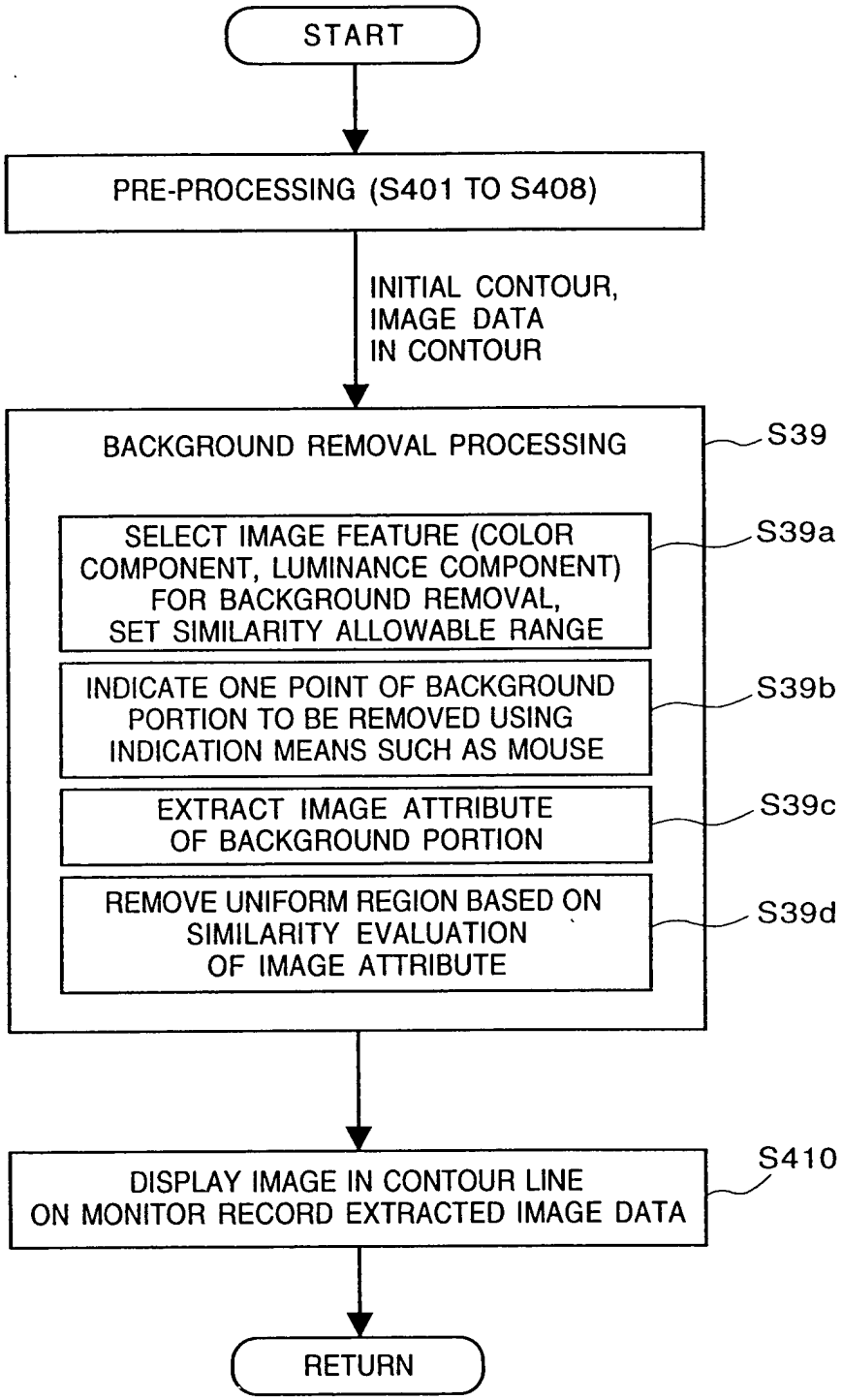

START
PRE-PROCESSING (S401 TO S408)
INITIAL CONTOUR,
IMAGE DATA
IN CONTOUR
BACKGROUND REMOVAL PROCESSING
S39
SELECT IMAGE FEATURE (COLOR COMPONENT, LUMINANCE COMPONENT) FOR BACKGROUND REMOVAL, SET SIMILARITY ALLOWABLE RANGE
S39a
INDICATE ONE POINT OF BACKGROUND PORTION TO BE REMOVED USING INDICATION MEANS SUCH AS MOUSE
S39b
EXTRACT IMAGE ATTRIBUTE OF BACKGROUND PORTION
S39c
REMOVE UNIFORM REGION BASED ON SIMILARITY EVALUATION OF IMAGE ATTRIBUTE
S39d
DISPLAY IMAGE IN CONTOUR LINE ON MONITOR RECORD EXTRACTED IMAGE DATA
S410
RETURN

FIG. 13

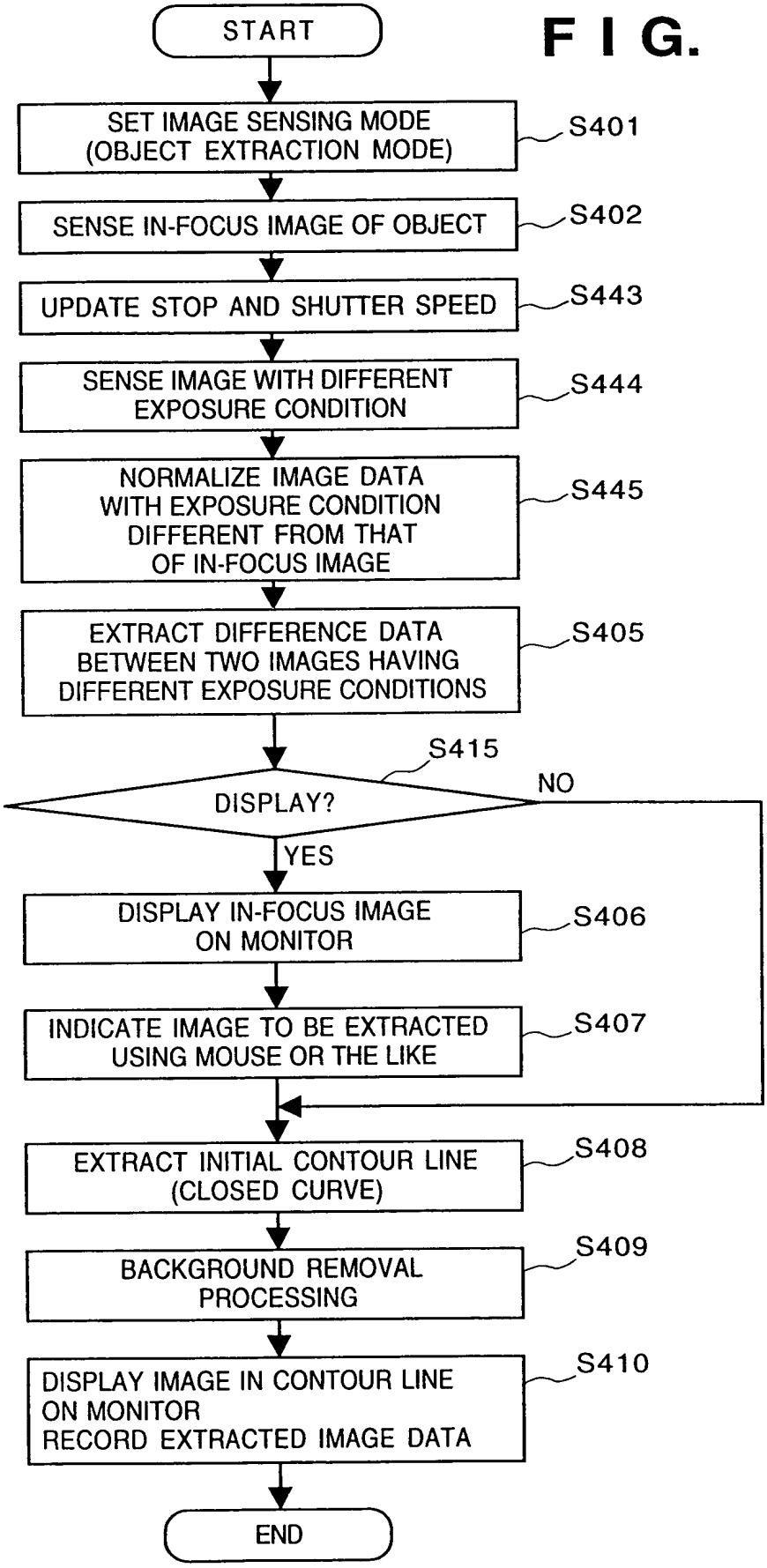
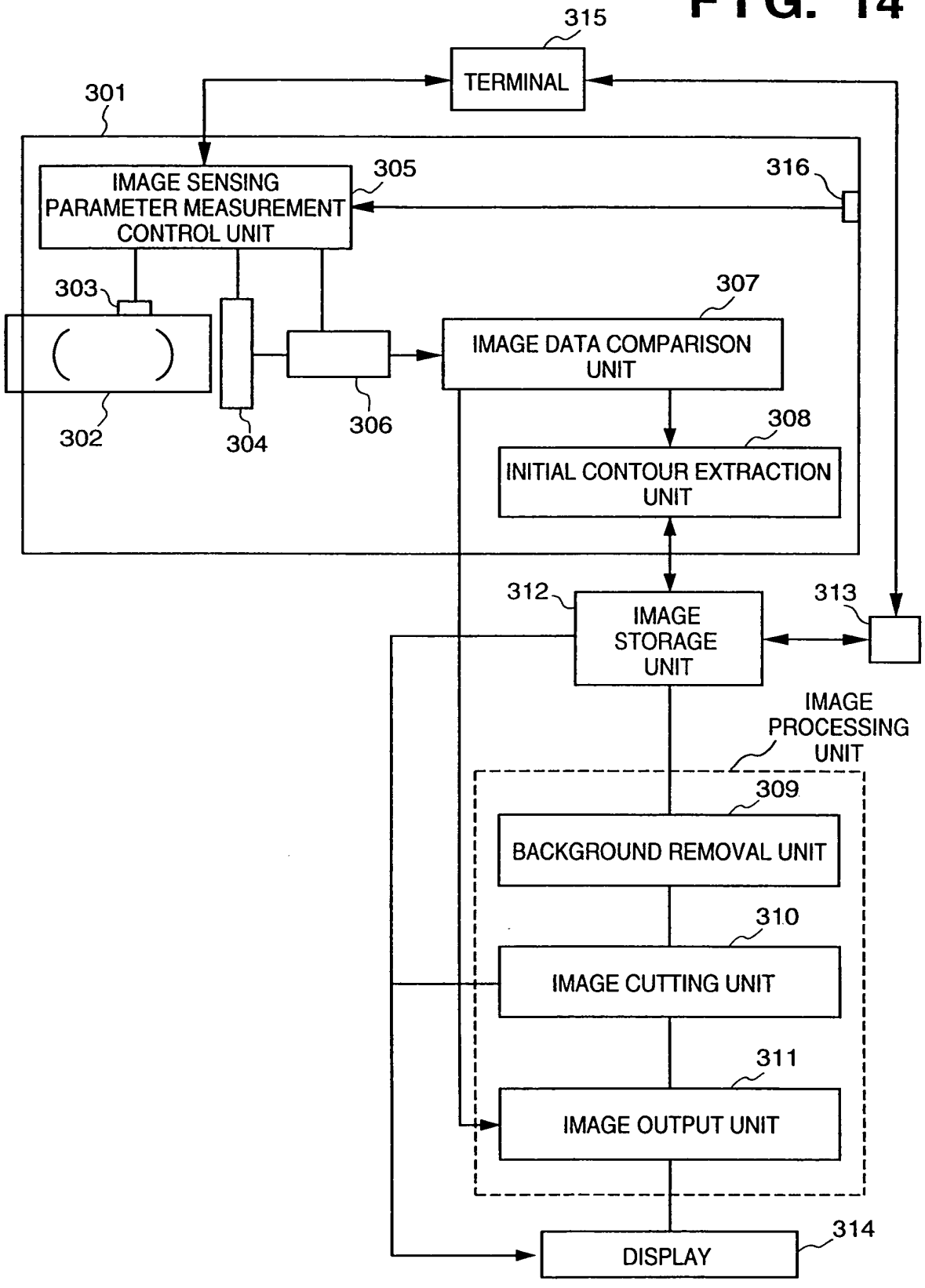

START
SET IMAGE SENSING MODE (OBJECT EXTRACTION MODE)
S401
SENSE IN-FOCUS IMAGE OF OBJECT
S402
UPDATE STOP AND SHUTTER SPEED
S443
SENSE IMAGE WITH DIFFERENT EXPOSURE CONDITION
S444
NORMALIZE IMAGE DATA WITH EXPOSURE CONDITION DIFFERENT FROM THAT OF IN-FOCUS IMAGE
S445
EXTRACT DIFFERENCE DATA BETWEEN TWO IMAGES HAVING DIFFERENT EXPOSURE CONDITIONS
S405
S415
DISPLAY?
NO
YES
DISPLAY IN-FOCUS IMAGE ON MONITOR
S406
INDICATE IMAGE TO BE EXTRACTED USING MOUSE OR THE LIKE
S407
EXTRACT INITIAL CONTOUR LINE (CLOSED CURVE)
S408
BACKGROUND REMOVAL PROCESSING
S409
DISPLAY IMAGE IN CONTOUR LINE ON MONITOR
RECORD EXTRACTED IMAGE DATA
S410
END

FIG. 14


315
TERMINAL
301
IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
305
316
303
307
IMAGE DATA COMPARISON UNIT
302
304
306
308
INITIAL CONTOUR EXTRACTION UNIT
312
IMAGE STORAGE UNIT
313
IMAGE PROCESSING UNIT
309
BACKGROUND REMOVAL UNIT
310
IMAGE CUTTING UNIT
311
IMAGE OUTPUT UNIT
314
DISPLAY

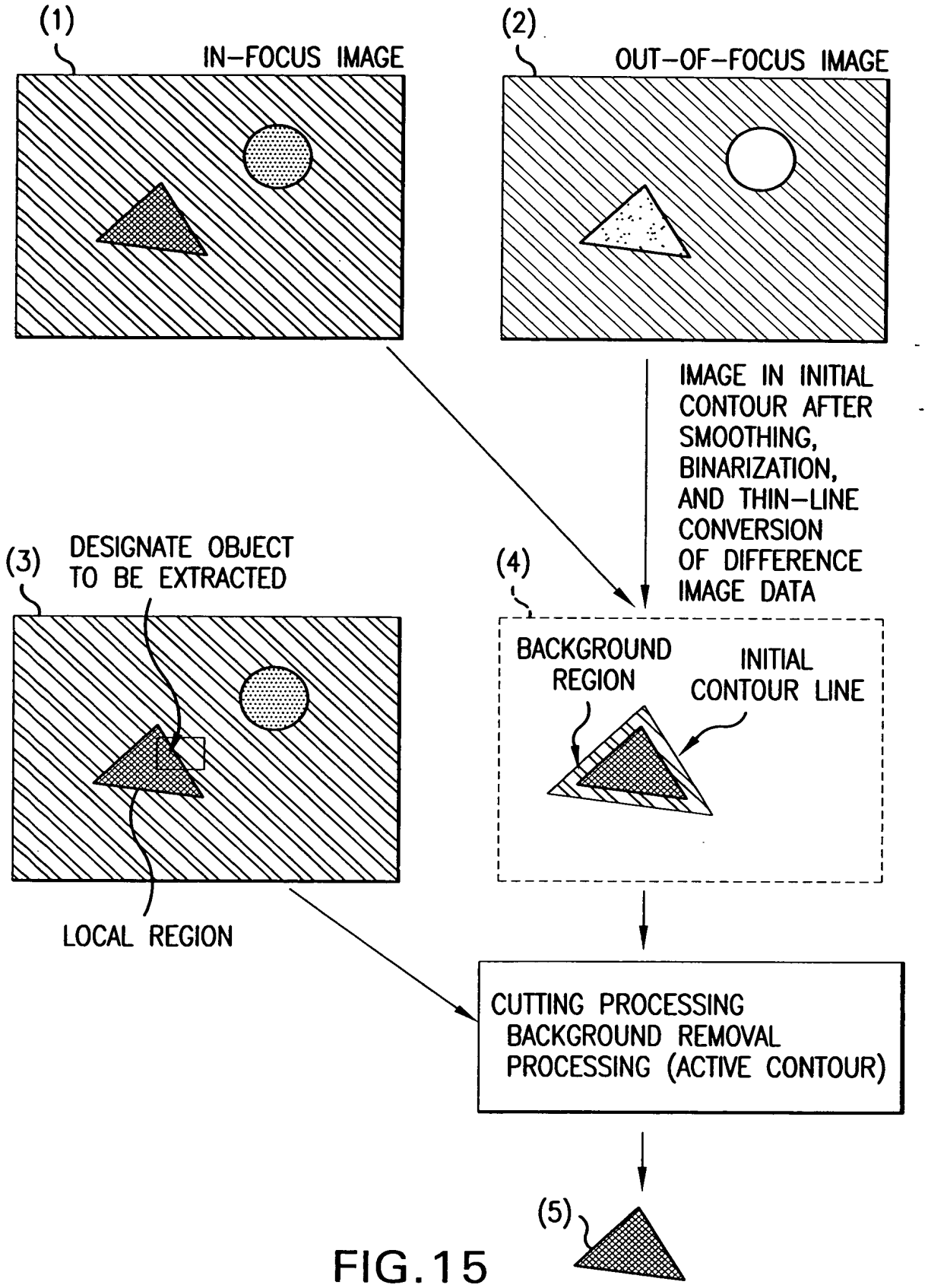

(1)
IN-FOCUS IMAGE
(2)
OUT-OF-FOCUS IMAGE
IMAGE IN INITIAL CONTOUR AFTER SMOOTHING, BINARIZATION, AND THIN-LINE CONVERSION OF DIFFERENCE IMAGE DATA
(3)
DESIGNATE OBJECT TO BE EXTRACTED
(4)
BACKGROUND REGION
INITIAL CONTOUR LINE
LOCAL REGION
CUTTING PROCESSING BACKGROUND REMOVAL PROCESSING (ACTIVE CONTOUR)
(5)

FIG.15

FIG. 16

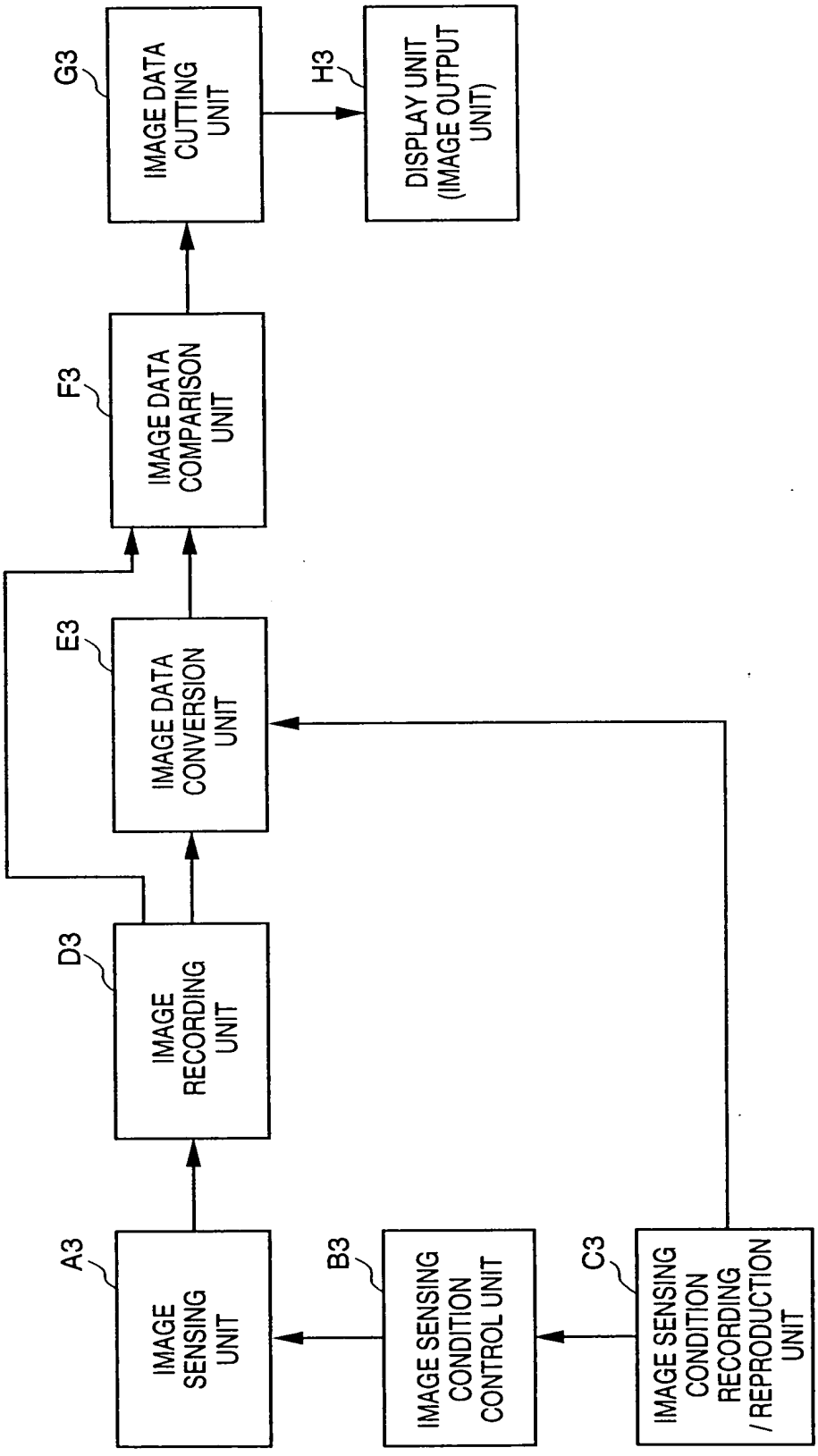

A3
IMAGE SENSING UNIT
B3
IMAGE SENSING CONDITION CONTROL UNIT
C3
IMAGE SENSING CONDITION RECORDING / REPRODUCTION UNIT
D3
IMAGE RECORDING UNIT
E3
IMAGE DATA CONVERSION UNIT
F3
IMAGE DATA COMPARISON UNIT
G3
IMAGE DATA CUTTING UNIT
H3
DISPLAY UNIT (IMAGE OUTPUT UNIT)

FIG. 17

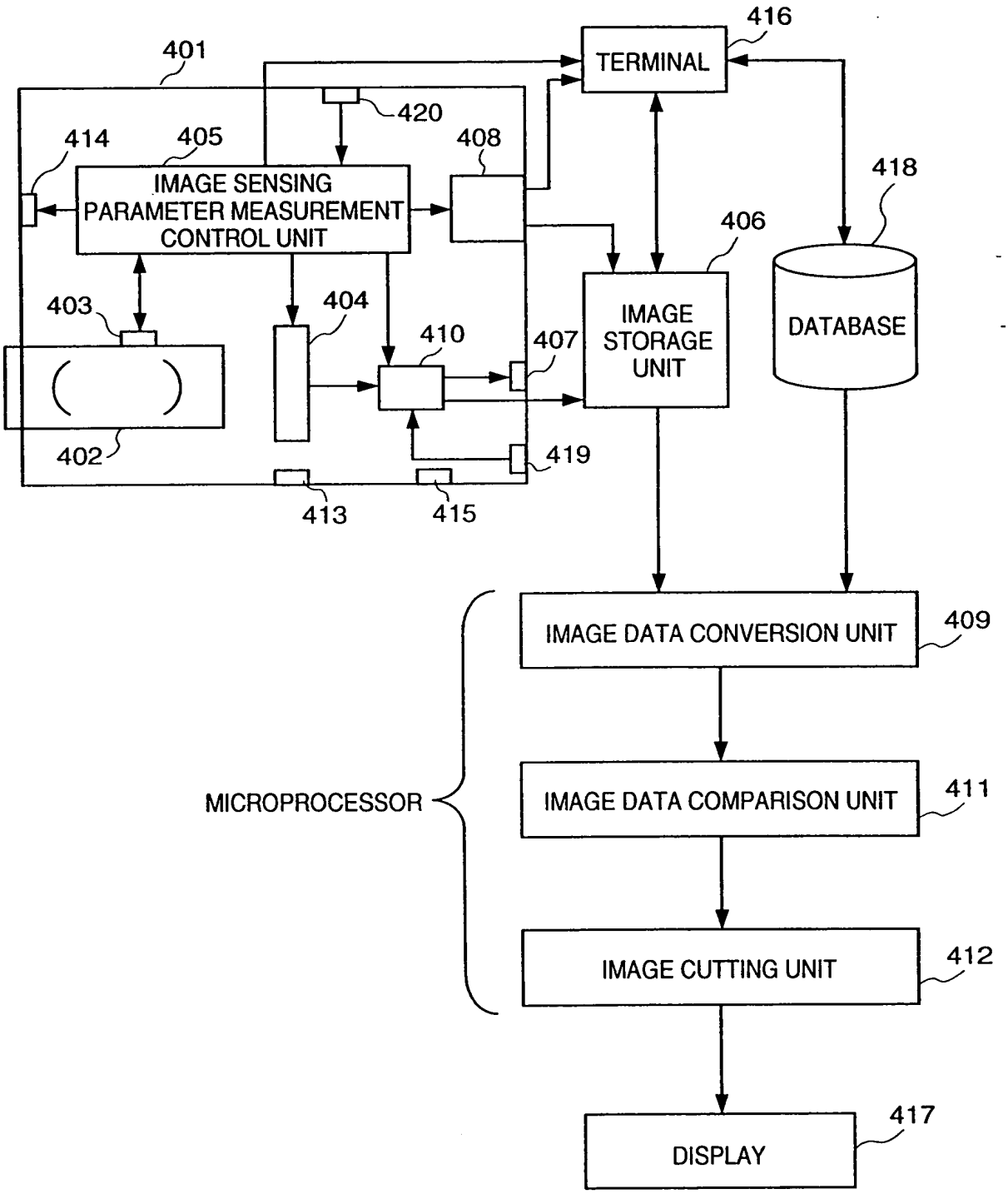

401
TERMINAL
416
420
414
405
408
IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
418
406
403
404
410
407
IMAGE STORAGE UNIT
DATABASE
402
419
413
415
IMAGE DATA CONVERSION UNIT
409
MICROPROCESSOR
IMAGE DATA COMPARISON UNIT
411
IMAGE CUTTING UNIT
412
DISPLAY
417

FIG. 18

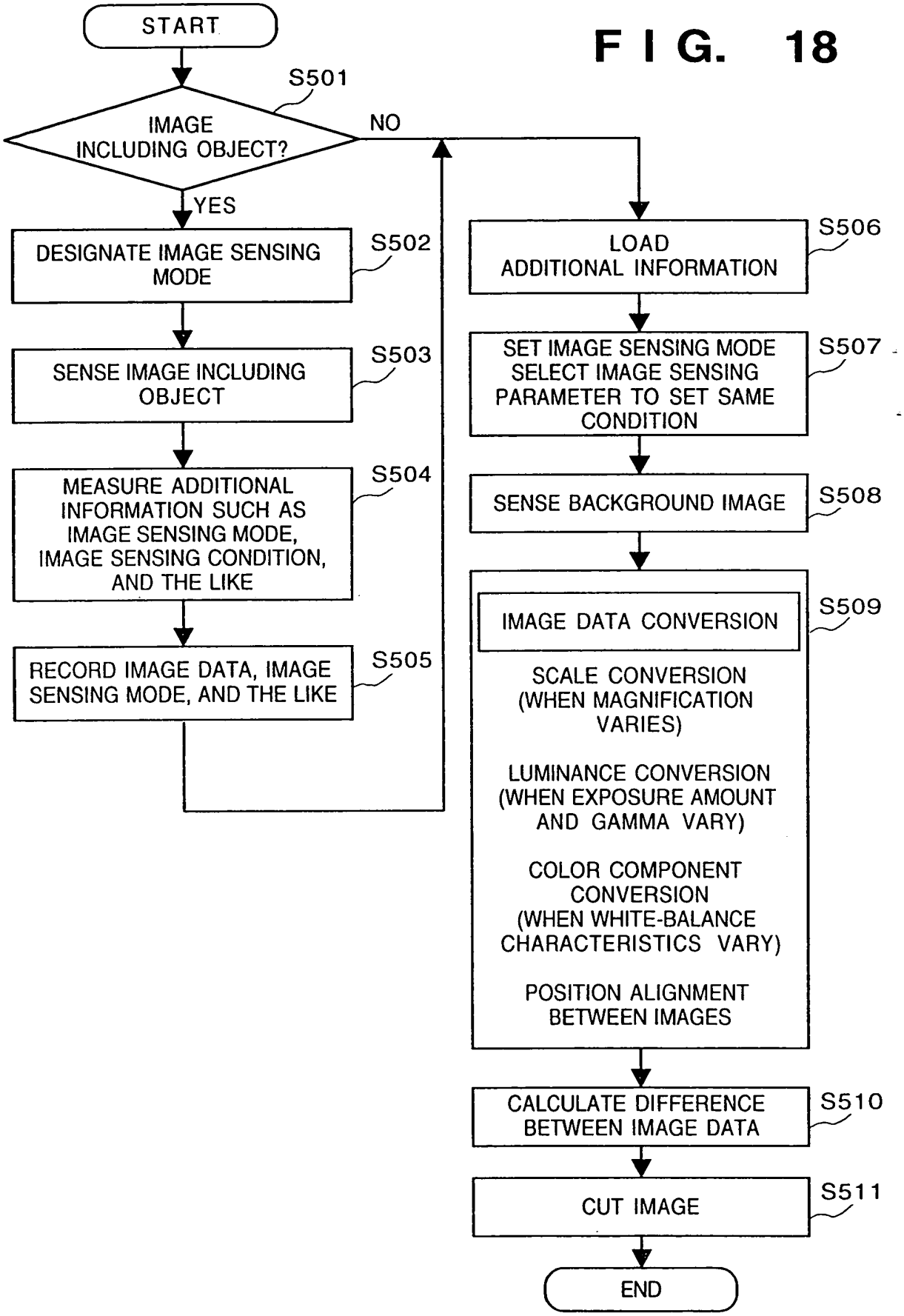

START
S501
IMAGE INCLUDING OBJECT?
NO
YES
DESIGNATE IMAGE SENSING MODE
S502
SENSE IMAGE INCLUDING OBJECT
S503
MEASURE ADDITIONAL INFORMATION SUCH AS IMAGE SENSING MODE, IMAGE SENSING CONDITION, AND THE LIKE
S504
RECORD IMAGE DATA, IMAGE SENSING MODE, AND THE LIKE
S505
LOAD ADDITIONAL INFORMATION
S506
SET IMAGE SENSING MODE SELECT IMAGE SENSING PARAMETER TO SET SAME CONDITION
S507
SENSE BACKGROUND IMAGE
S508
IMAGE DATA CONVERSION
S509
SCALE CONVERSION (WHEN MAGNIFICATION VARIES)
LUMINANCE CONVERSION (WHEN EXPOSURE AMOUNT AND GAMMA VARY)
COLOR COMPONENT CONVERSION (WHEN WHITE-BALANCE CHARACTERISTICS VARY)
POSITION ALIGNMENT BETWEEN IMAGES
CALCULATE DIFFERENCE BETWEEN IMAGE DATA
S510
CUT IMAGE
S511
END

FIG. 19

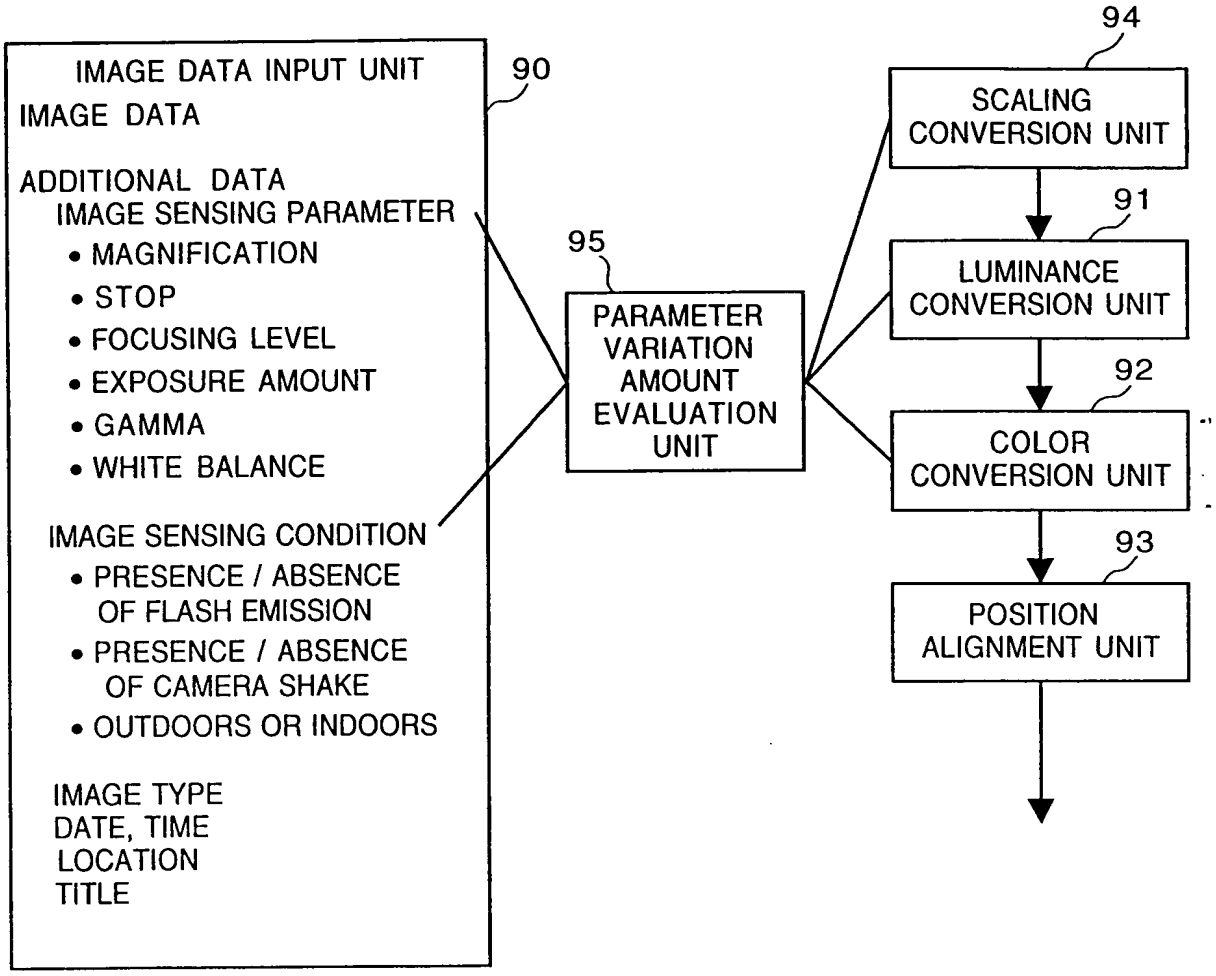


IMAGE DATA INPUT UNIT
90
IMAGE DATA
ADDITIONAL DATA
IMAGE SENSING PARAMETER
• MAGNIFICATION
• STOP
• FOCUSING LEVEL
• EXPOSURE AMOUNT
• GAMMA
• WHITE BALANCE
IMAGE SENSING CONDITION
• PRESENCE / ABSENCE OF FLASH EMISSION
• PRESENCE / ABSENCE OF CAMERA SHAKE
• OUTDOORS OR INDOORS
IMAGE TYPE
DATE, TIME
LOCATION
TITLE
95
PARAMETER VARIATION AMOUNT EVALUATION UNIT
94
SCALING CONVERSION UNIT
91
LUMINANCE CONVERSION UNIT
92
COLOR CONVERSION UNIT
93
POSITION ALIGNMENT UNIT

FIG. 20

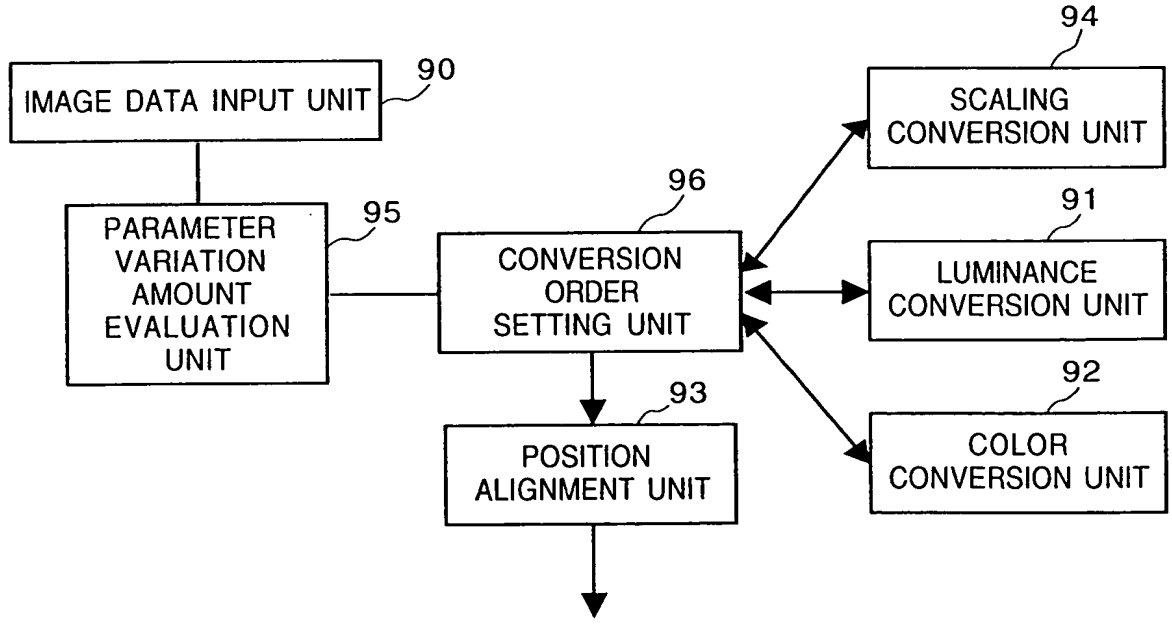
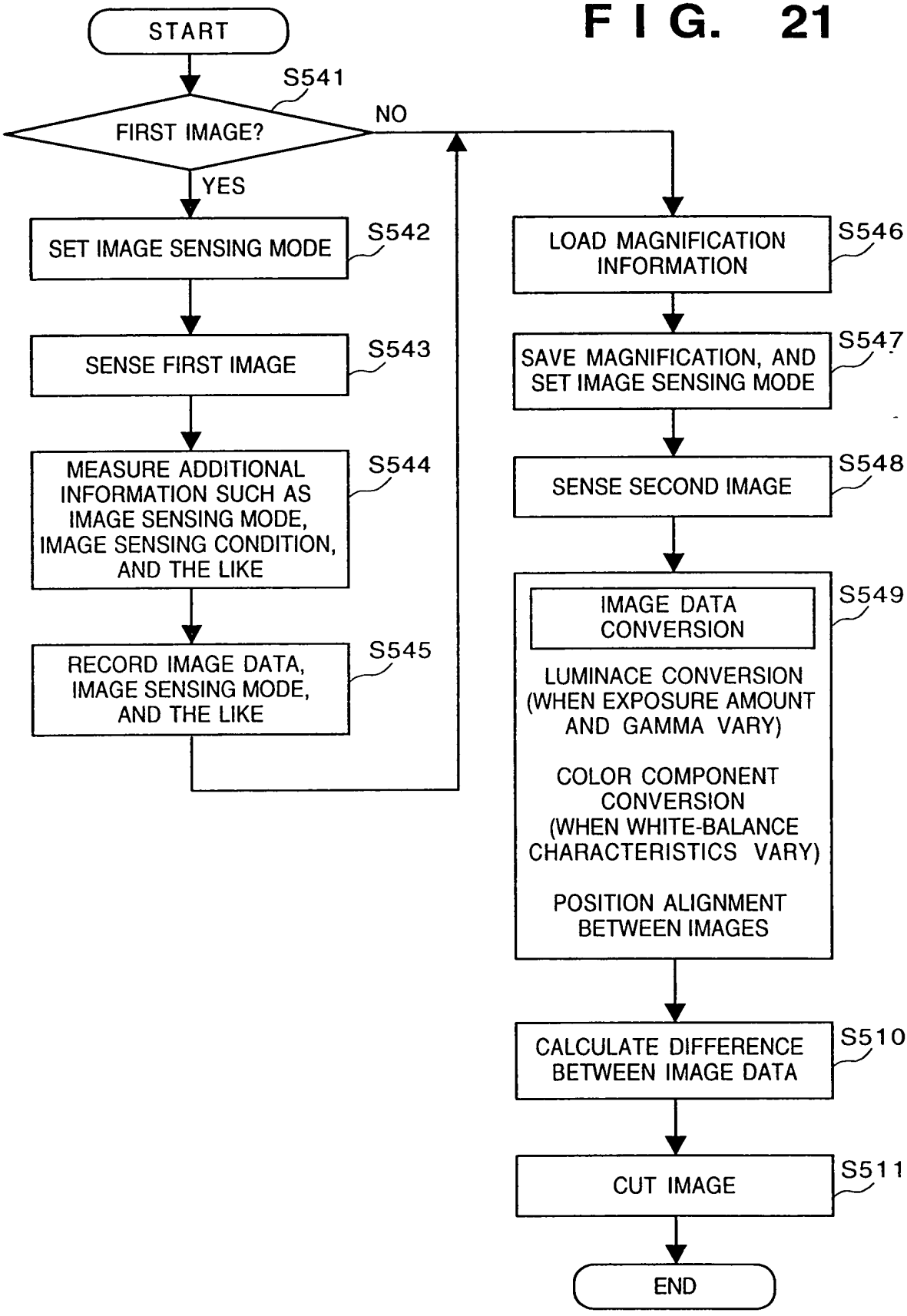


IMAGE DATA INPUT UNIT
90
PARAMETER VARIATION AMOUNT EVALUATION UNIT
95
96
CONVERSION ORDER SETTING UNIT
93
POSITION ALIGNMENT UNIT
94
SCALING CONVERSION UNIT
91
LUMINANCE CONVERSION UNIT
92
COLOR CONVERSION UNIT

FIG. 21


START
S541
FIRST IMAGE?
NO
YES
SET IMAGE SENSING MODE
S542
SENSE FIRST IMAGE
S543
MEASURE ADDITIONAL INFORMATION SUCH AS IMAGE SENSING MODE, IMAGE SENSING CONDITION, AND THE LIKE
S544
RECORD IMAGE DATA, IMAGE SENSING MODE, AND THE LIKE
S545
LOAD MAGNIFICATION INFORMATION
S546
SAVE MAGNIFICATION, AND SET IMAGE SENSING MODE
S547
SENSE SECOND IMAGE
S548
IMAGE DATA CONVERSION
S549
LUMINACE CONVERSION (WHEN EXPOSURE AMOUNT AND GAMMA VARY)
COLOR COMPONENT CONVERSION (WHEN WHITE-BALANCE CHARACTERISTICS VARY)
POSITION ALIGNMENT BETWEEN IMAGES
CALCULATE DIFFERENCE BETWEEN IMAGE DATA
S510
CUT IMAGE
S511
END

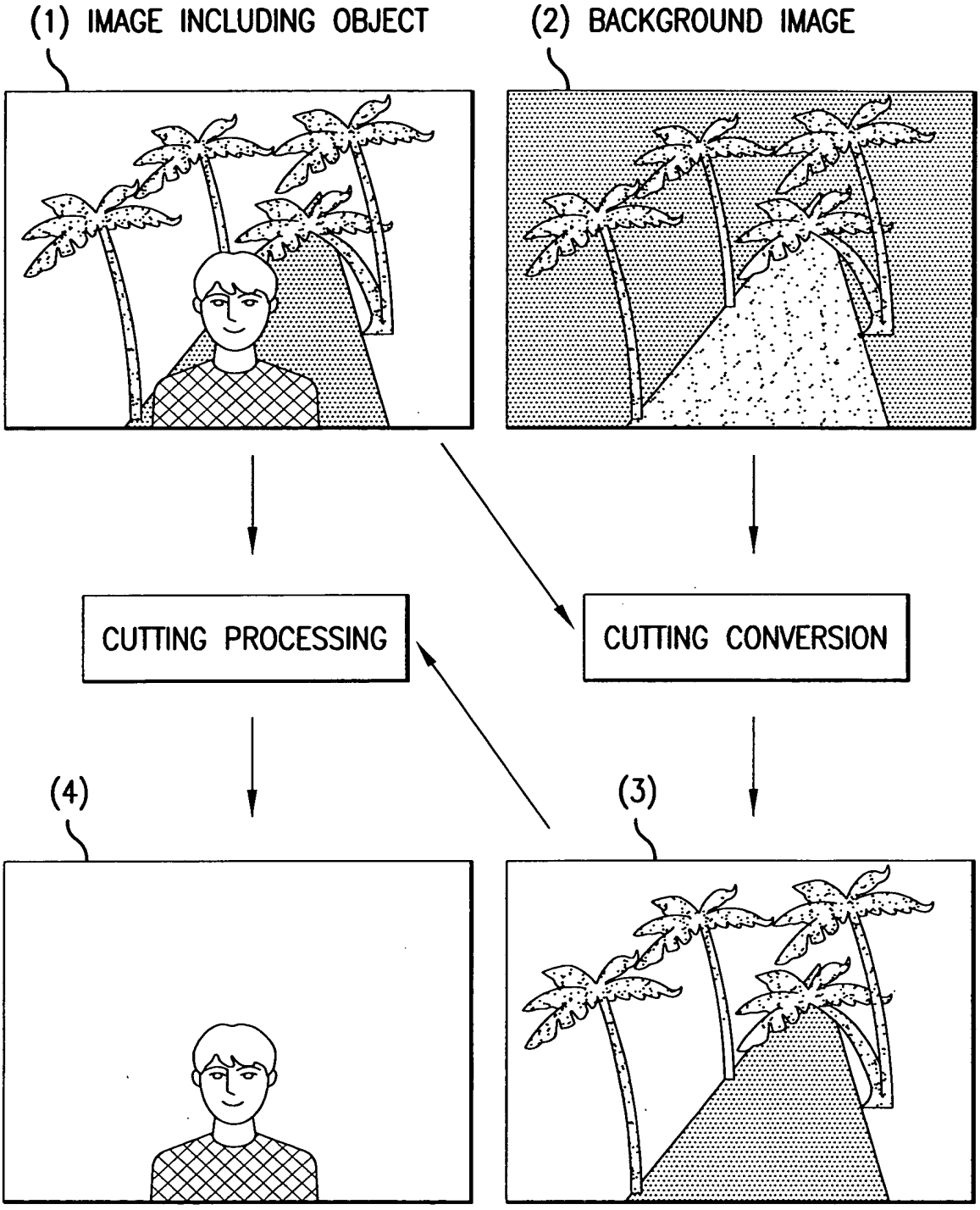

(1) IMAGE INCLUDING OBJECT
(2) BACKGROUND IMAGE
CUTTING PROCESSING
CUTTING CONVERSION
(4)
(3)

FIG.22

FIG. 23

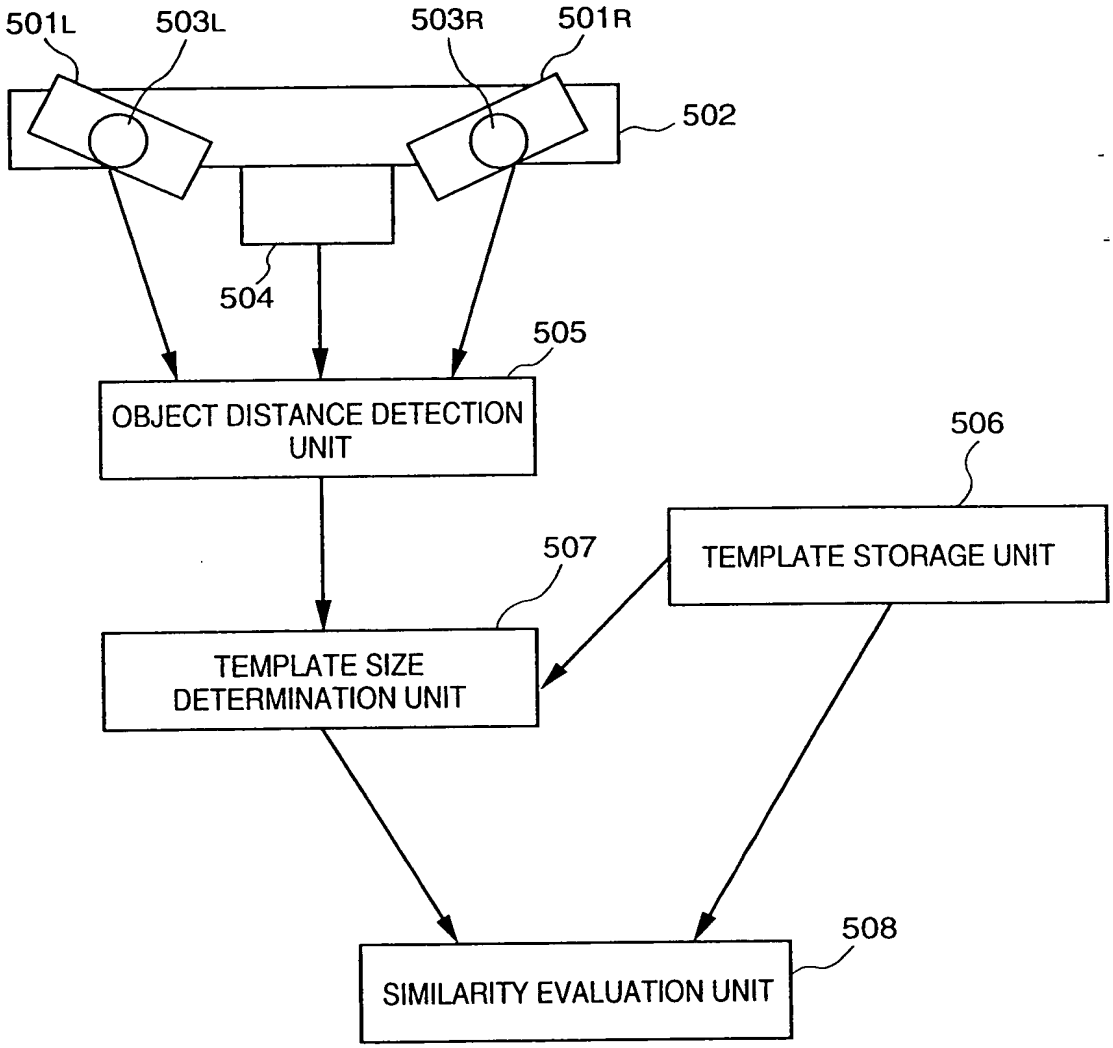

501L
503L
503R
501R
502
504
505
OBJECT DISTANCE DETECTION UNIT
506
TEMPLATE STORAGE UNIT
507
TEMPLATE SIZE DETERMINATION UNIT
508
SIMILARITY EVALUATION UNIT

FIG. 24

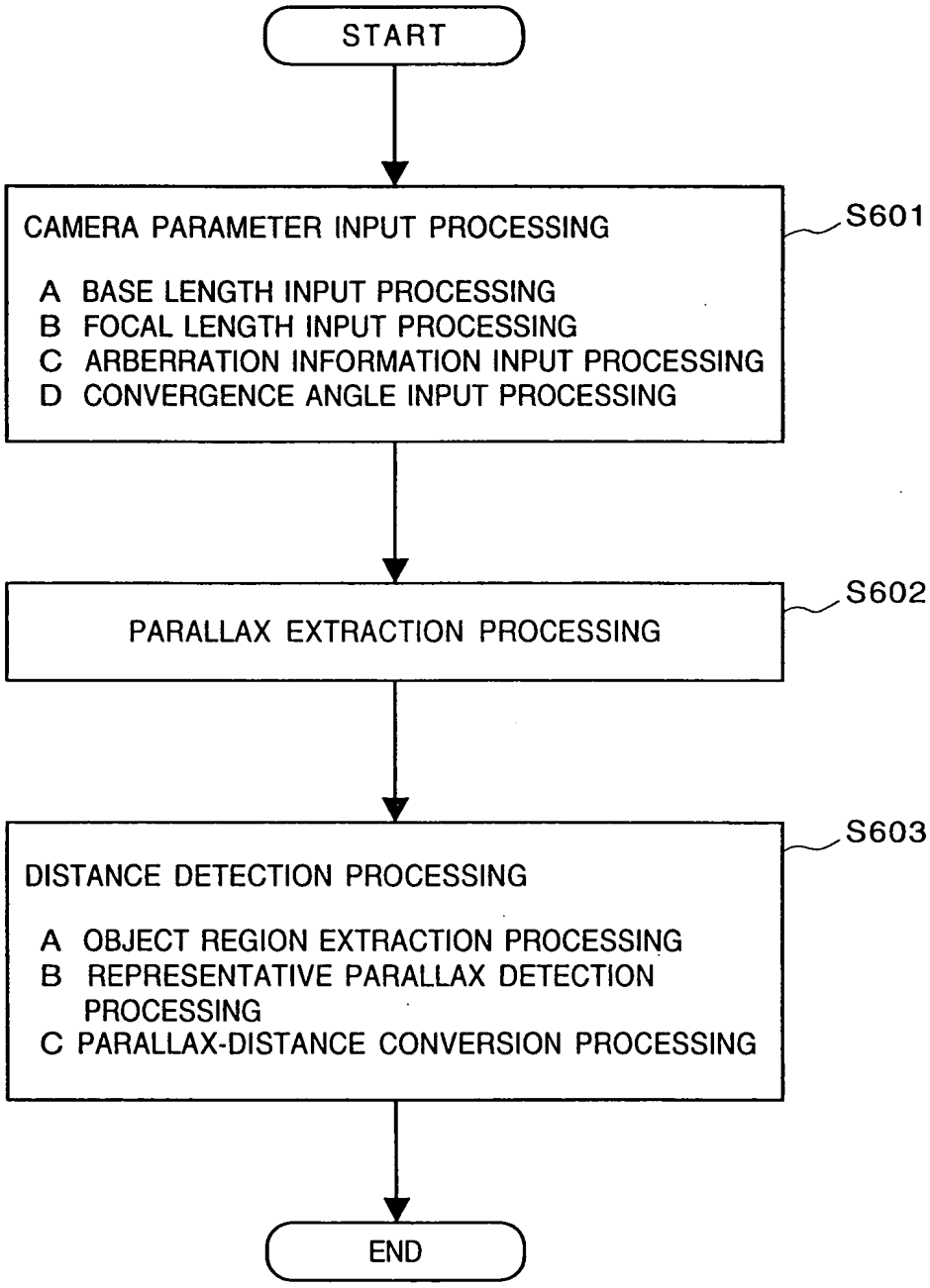

START
CAMERA PARAMETER INPUT PROCESSING
A BASE LENGTH INPUT PROCESSING
B FOCAL LENGTH INPUT PROCESSING
C ARBERRATION INFORMATION INPUT PROCESSING
D CONVERGENCE ANGLE INPUT PROCESSING
S601
PARALLAX EXTRACTION PROCESSING
S602
DISTANCE DETECTION PROCESSING
A OBJECT REGION EXTRACTION PROCESSING
B REPRESENTATIVE PARALLAX DETECTION PROCESSING
C PARALLAX-DISTANCE CONVERSION PROCESSING
S603
END

FIG. 25

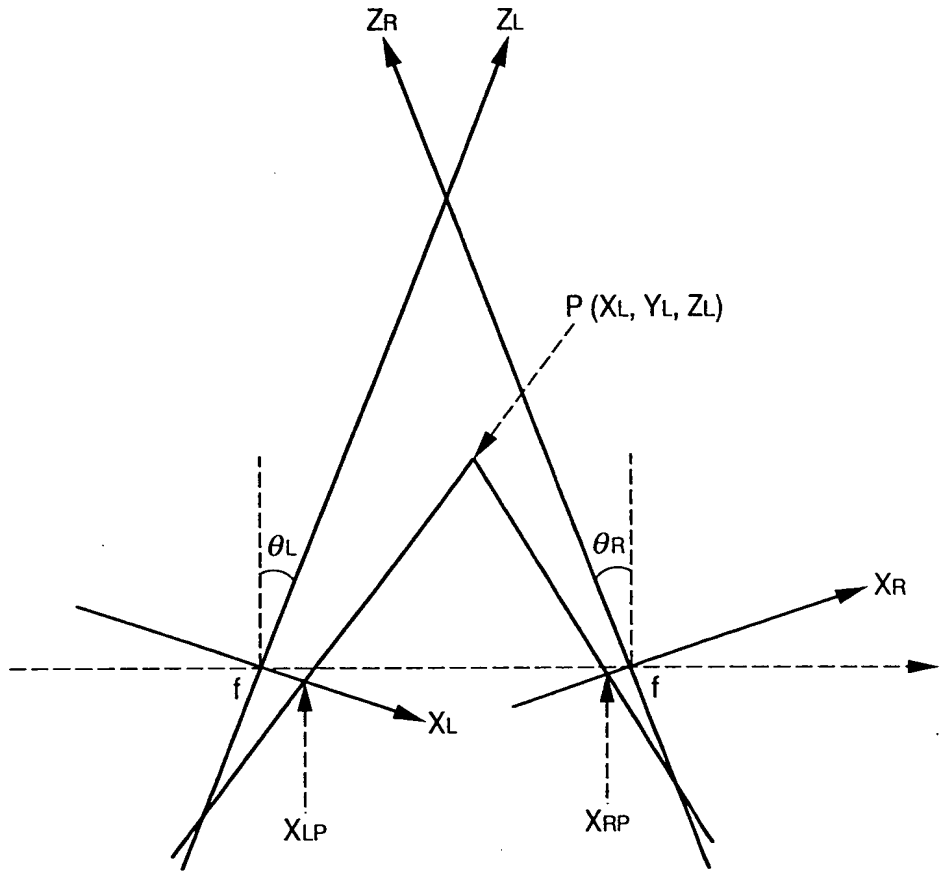


FIG. 26

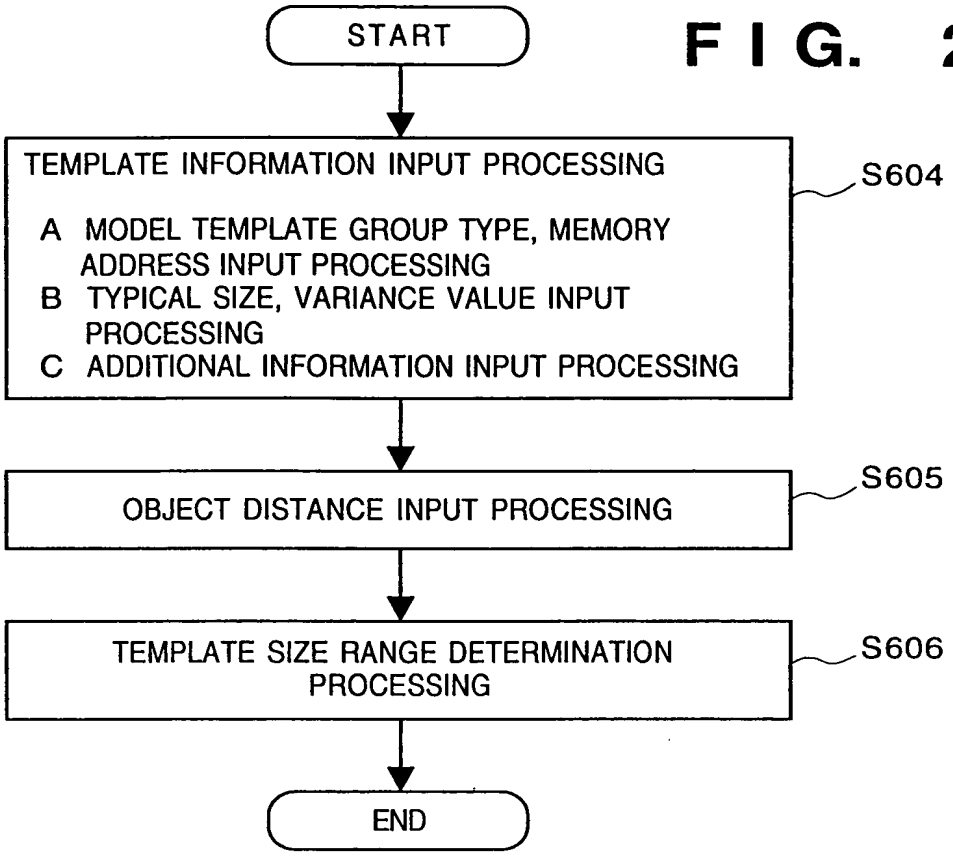

START
TEMPLATE INFORMATION INPUT PROCESSING
A MODEL TEMPLATE GROUP TYPE, MEMORY ADDRESS INPUT PROCESSING
B TYPICAL SIZE, VARIANCE VALUE INPUT PROCESSING
C ADDITIONAL INFORMATION INPUT PROCESSING
S604
OBJECT DISTANCE INPUT PROCESSING
S605
TEMPLATE SIZE RANGE DETERMINATION PROCESSING
S606
END

FIG. 27

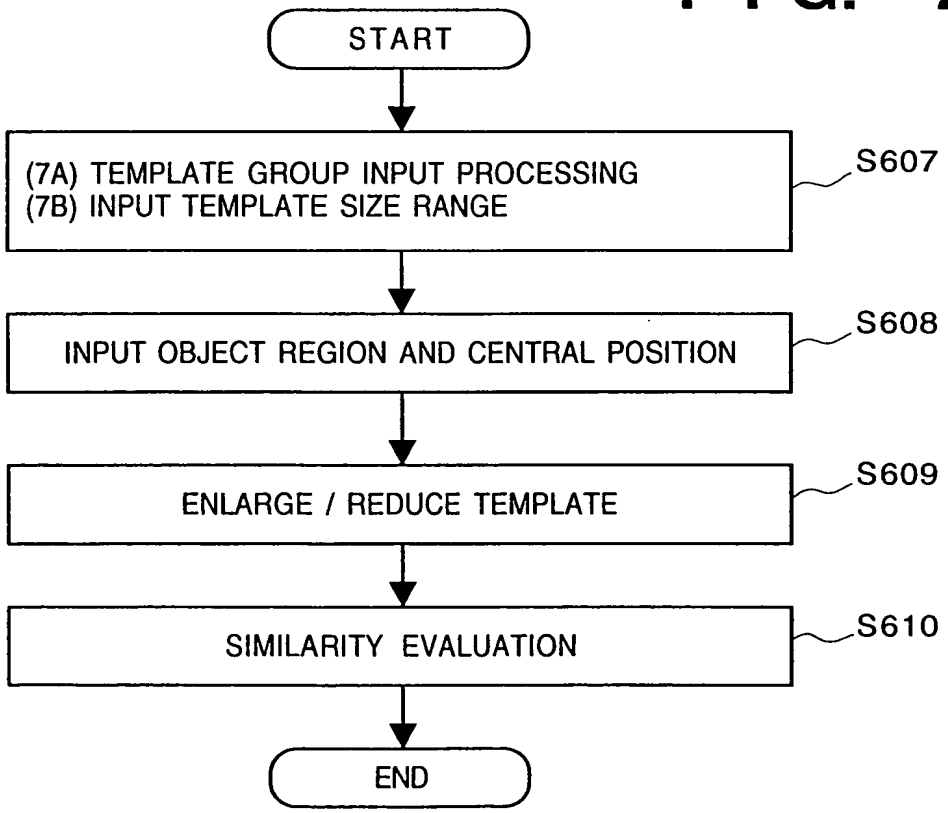

START
(7A) TEMPLATE GROUP INPUT PROCESSING
(7B) INPUT TEMPLATE SIZE RANGE
S607
INPUT OBJECT REGION AND CENTRAL POSITION
S608
ENLARGE / REDUCE TEMPLATE
S609
SIMILARITY EVALUATION
S610
END

FIG. 28

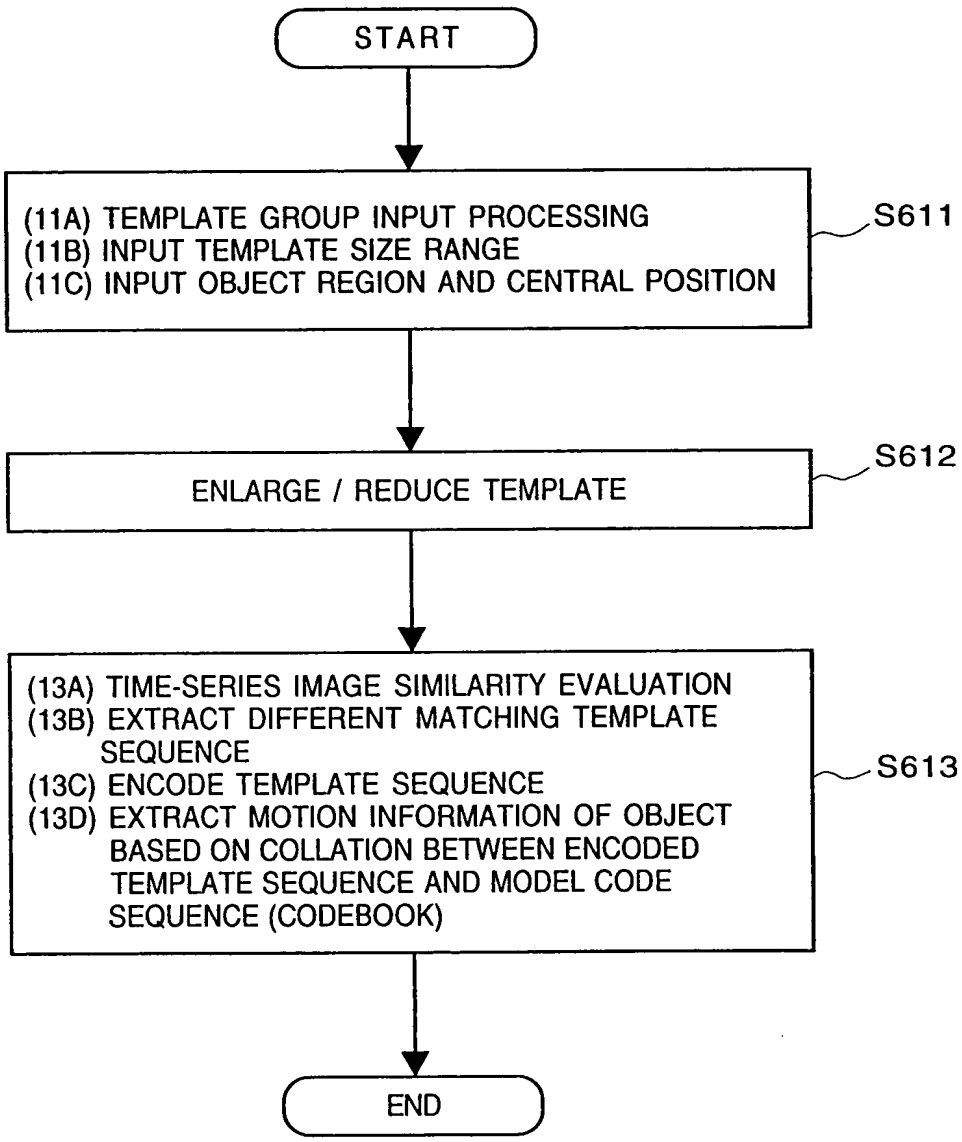

START
(11A) TEMPLATE GROUP INPUT PROCESSING
(11B) INPUT TEMPLATE SIZE RANGE
(11C) INPUT OBJECT REGION AND CENTRAL POSITION
S611
ENLARGE / REDUCE TEMPLATE
S612
(13A) TIME-SERIES IMAGE SIMILARITY EVALUATION
(13B) EXTRACT DIFFERENT MATCHING TEMPLATE SEQUENCE
(13C) ENCODE TEMPLATE SEQUENCE
(13D) EXTRACT MOTION INFORMATION OF OBJECT BASED ON COLLATION BETWEEN ENCODED TEMPLATE SEQUENCE AND MODEL CODE SEQUENCE (CODEBOOK)
S613
END

FIG. 29

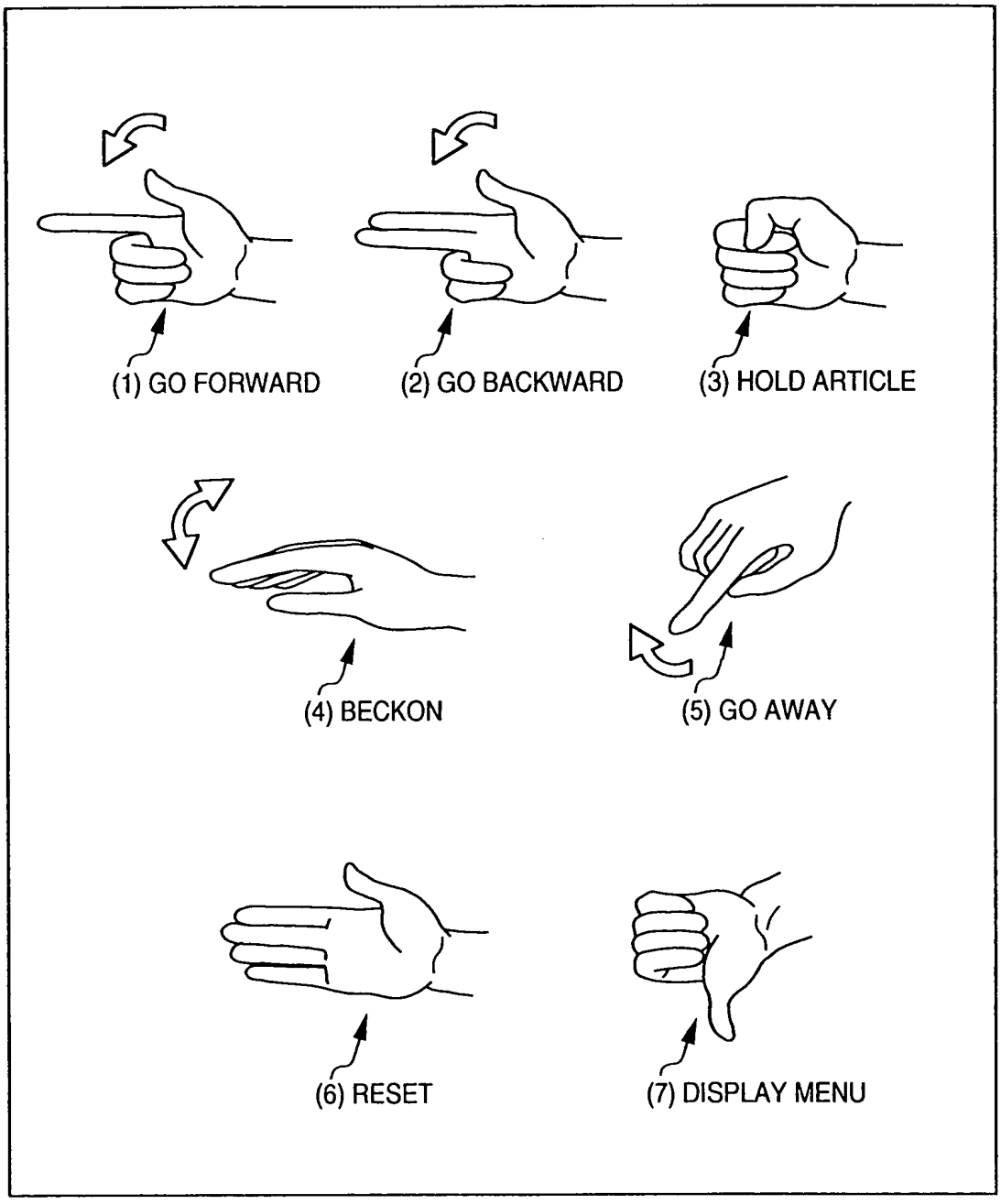

(1) GO FORWARD
(2) GO BACKWARD
(3) HOLD ARTICLE
(4) BECKON
(5) GO AWAY
(6) RESET
(7) DISPLAY MENU

FIG. 30

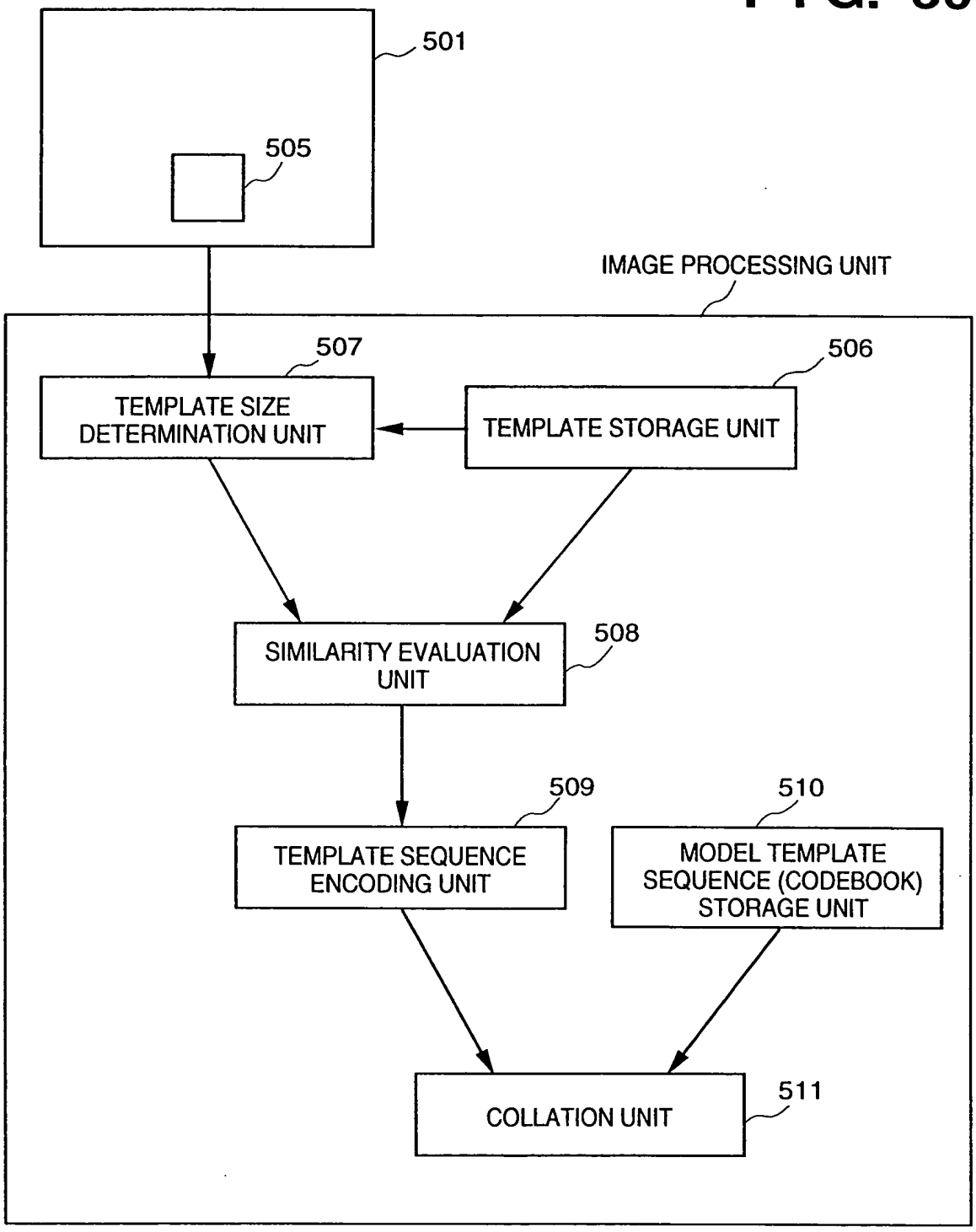

501
505
IMAGE PROCESSING UNIT
507
TEMPLATE SIZE DETERMINATION UNIT
506
TEMPLATE STORAGE UNIT
SIMILARITY EVALUATION UNIT
508
509
TEMPLATE SEQUENCE ENCODING UNIT
510
MODEL TEMPLATE SEQUENCE (CODEBOOK) STORAGE UNIT
COLLATION UNIT
511

FIG. 31

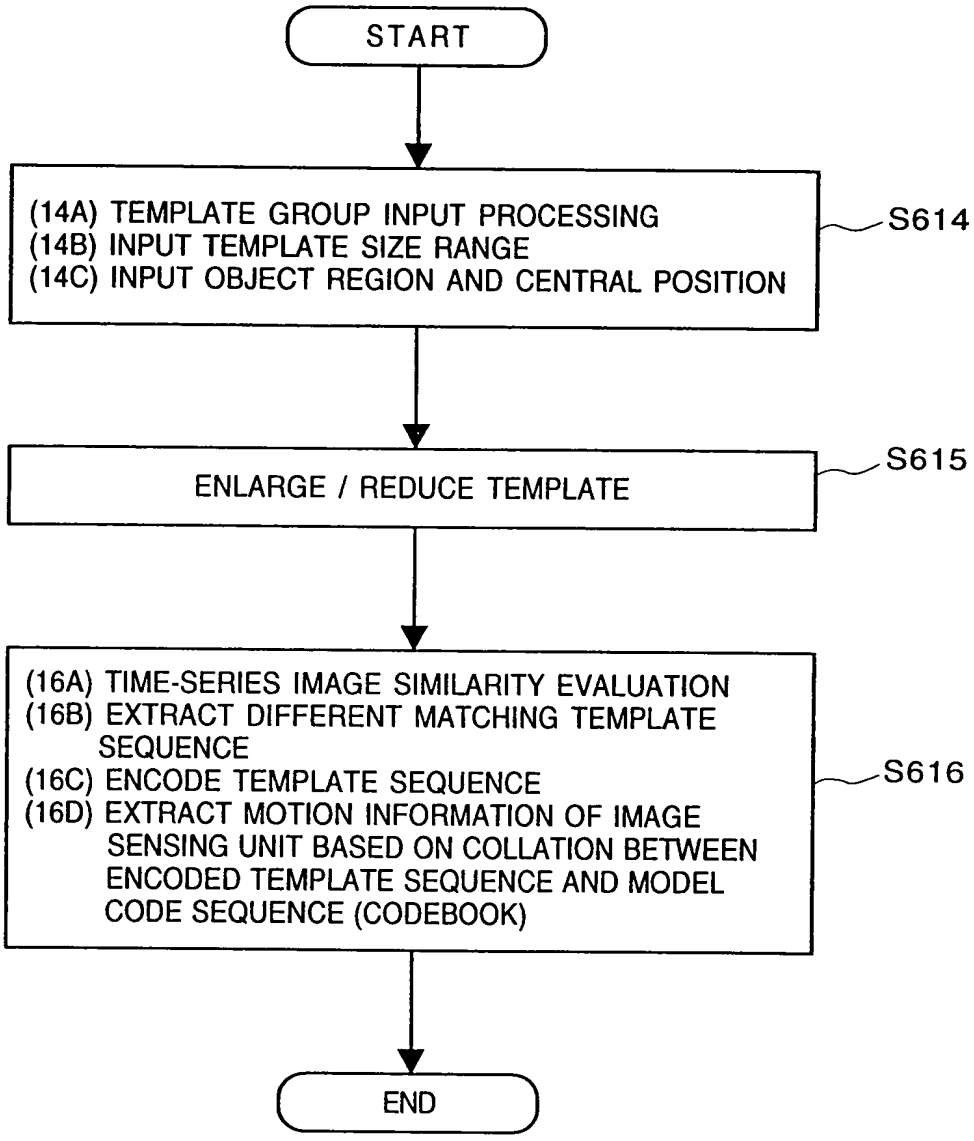

START
(14A) TEMPLATE GROUP INPUT PROCESSING
(14B) INPUT TEMPLATE SIZE RANGE
(14C) INPUT OBJECT REGION AND CENTRAL POSITION
S614
ENLARGE / REDUCE TEMPLATE
S615
(16A) TIME-SERIES IMAGE SIMILARITY EVALUATION
(16B) EXTRACT DIFFERENT MATCHING TEMPLATE SEQUENCE
(16C) ENCODE TEMPLATE SEQUENCE
(16D) EXTRACT MOTION INFORMATION OF IMAGE SENSING UNIT BASED ON COLLATION BETWEEN ENCODED TEMPLATE SEQUENCE AND MODEL CODE SEQUENCE (CODEBOOK)
S616
END

FIG. 32

ACTION CATEGORY (COMMAND)	ENCODED TEMPLATE SEQUENCE (CODEBOOK)
GO FORWARD	[1a – 1b – 1c ...] – [1a – 1b – 1c ...] – ...
GO BACKWARD	[2a – 2b – 2c ...] – [2a – 2b – 2c ...] – ...
HOLD	[3a – 3b – 3c ...] – [3a – 3b – 3c ...] – ...
BECKON	[4a – 4b – 4c ...] – [4a – 4b – 4c ...] – ...
GO AWAY	[5a – 5b – 5c ...] – [5a – 5b – 5c ...] – ...
RESET	[6a – 6b – 6c ...] – [6a – 6b – 6c ...] – ...

FIG. 33

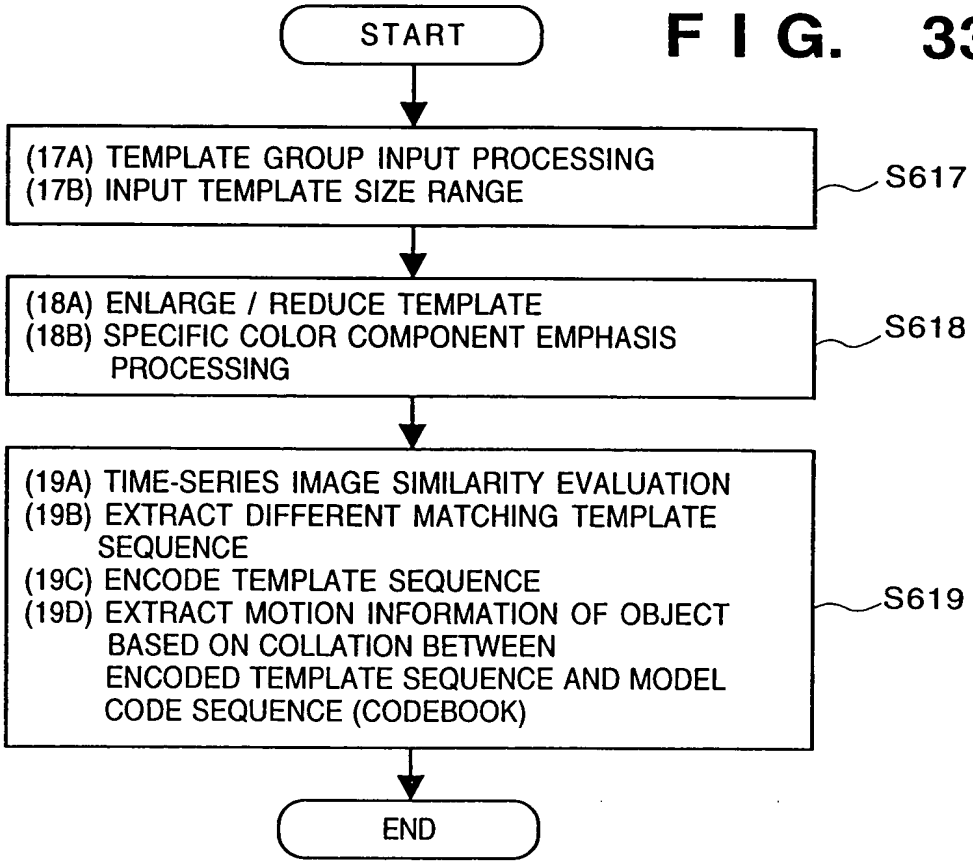

START
(17A) TEMPLATE GROUP INPUT PROCESSING
(17B) INPUT TEMPLATE SIZE RANGE
S617
(18A) ENLARGE / REDUCE TEMPLATE
(18B) SPECIFIC COLOR COMPONENT EMPHASIS PROCESSING
S618
(19A) TIME-SERIES IMAGE SIMILARITY EVALUATION
(19B) EXTRACT DIFFERENT MATCHING TEMPLATE SEQUENCE
(19C) ENCODE TEMPLATE SEQUENCE
(19D) EXTRACT MOTION INFORMATION OF OBJECT BASED ON COLLATION BETWEEN ENCODED TEMPLATE SEQUENCE AND MODEL CODE SEQUENCE (CODEBOOK)
S619
END

FIG. 34

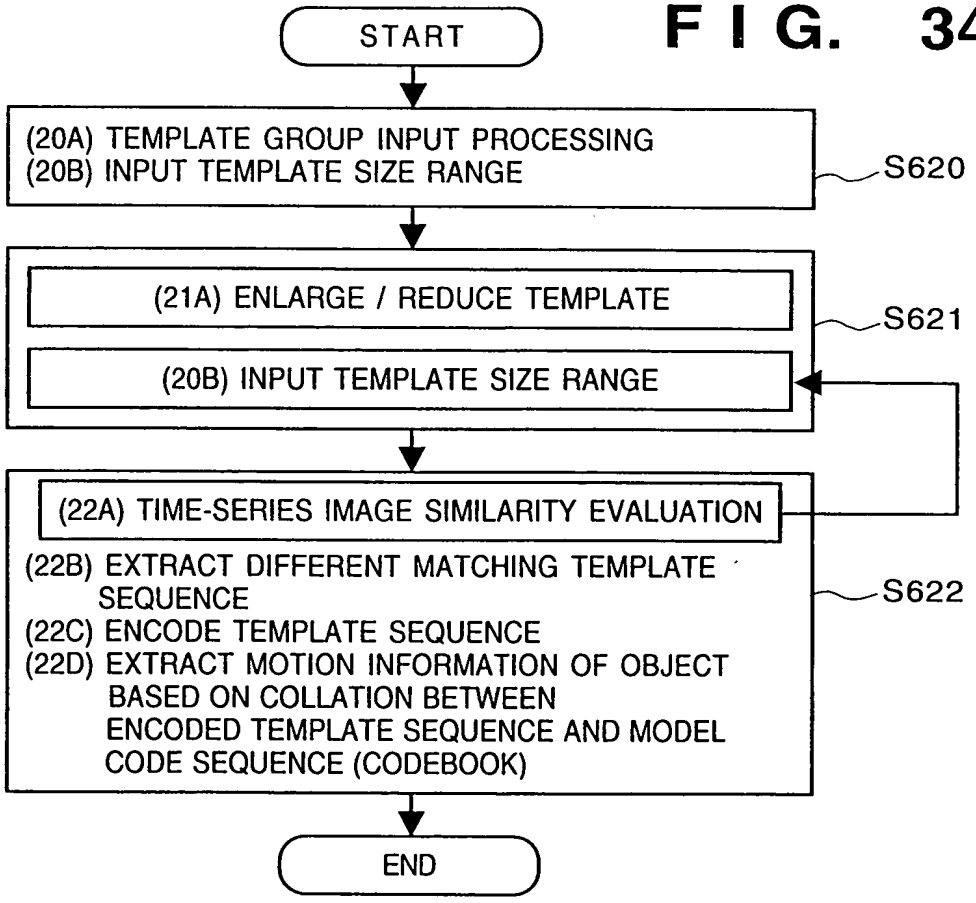

START
(20A) TEMPLATE GROUP INPUT PROCESSING
(20B) INPUT TEMPLATE SIZE RANGE
S620
(21A) ENLARGE / REDUCE TEMPLATE
(20B) INPUT TEMPLATE SIZE RANGE
S621
(22A) TIME-SERIES IMAGE SIMILARITY EVALUATION
(22B) EXTRACT DIFFERENT MATCHING TEMPLATE SEQUENCE
(22C) ENCODE TEMPLATE SEQUENCE
(22D) EXTRACT MOTION INFORMATION OF OBJECT BASED ON COLLATION BETWEEN ENCODED TEMPLATE SEQUENCE AND MODEL CODE SEQUENCE (CODEBOOK)
S622
END

FIG. 35

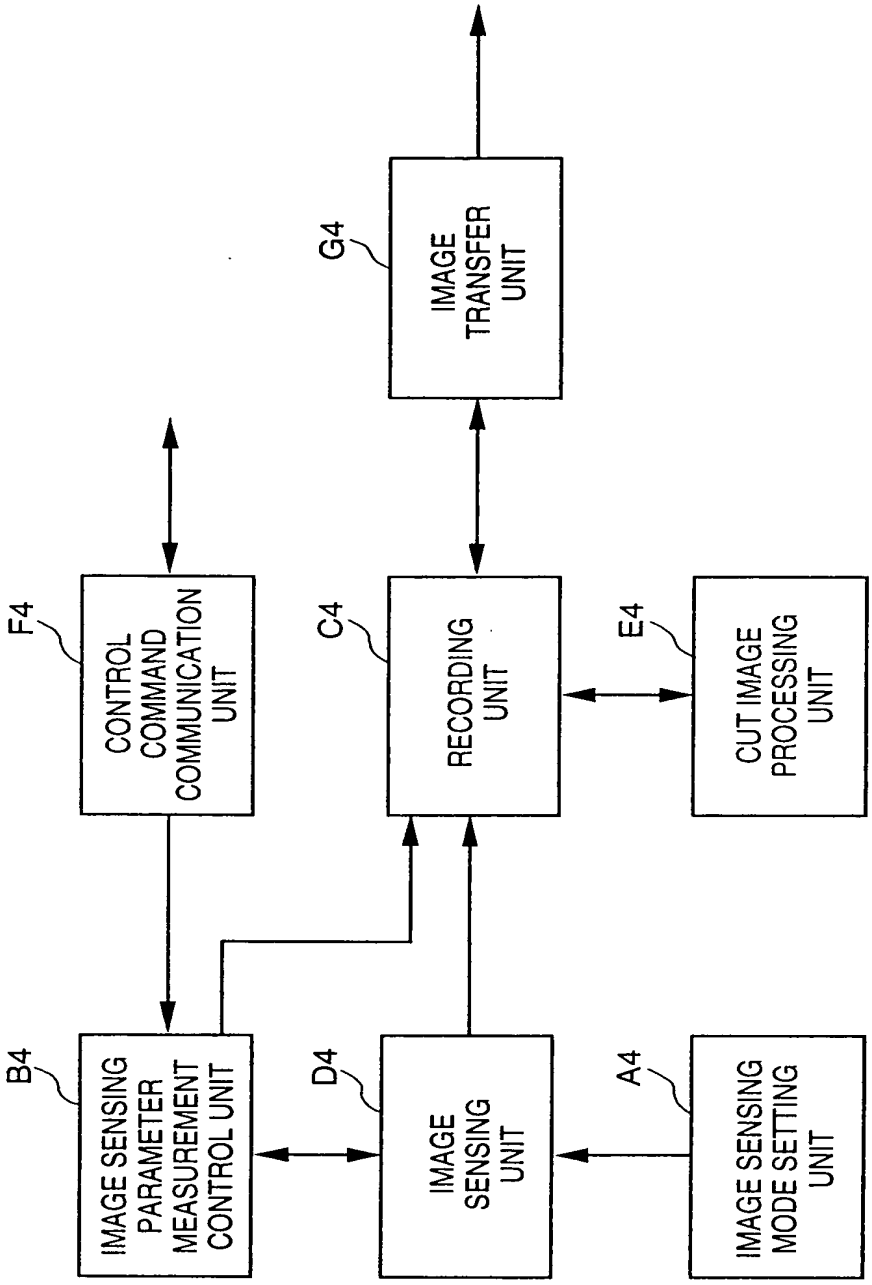

G4
IMAGE TRANSFER UNIT
F4
CONTROL COMMAND COMMUNICATION UNIT
C4
RECORDING UNIT
E4
CUT IMAGE PROCESSING UNIT
B4
IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
D4
IMAGE SENSING UNIT
A4
IMAGE SENSING MODE SETTING UNIT

FIG. 36

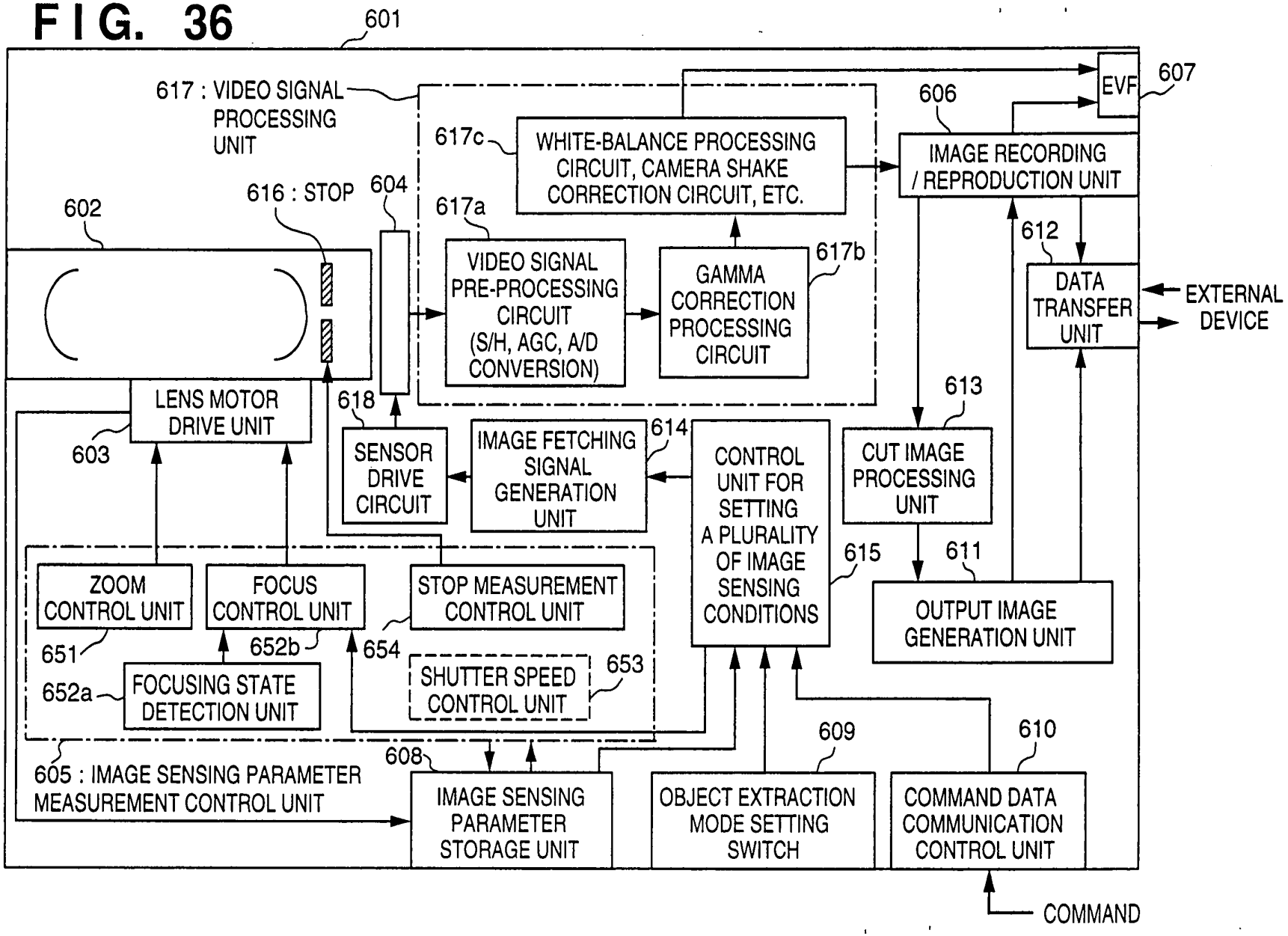

601
617 : VIDEO SIGNAL PROCESSING UNIT
617c
WHITE-BALANCE PROCESSING CIRCUIT, CAMERA SHAKE CORRECTION CIRCUIT, ETC.
606
EVF
607
IMAGE RECORDING / REPRODUCTION UNIT
602
616 : STOP
604
617a
VIDEO SIGNAL PRE-PROCESSING CIRCUIT (S/H, AGC, A/D CONVERSION)
GAMMA CORRECTION PROCESSING CIRCUIT
617b
612
DATA TRANSFER UNIT
EXTERNAL DEVICE
LENS MOTOR DRIVE UNIT
603
618
SENSOR DRIVE CIRCUIT
IMAGE FETCHING SIGNAL GENERATION UNIT
614
CONTROL UNIT FOR SETTING A PLURALITY OF IMAGE SENSING CONDITIONS
615
613
CUT IMAGE PROCESSING UNIT
611
OUTPUT IMAGE GENERATION UNIT
ZOOM CONTROL UNIT
651
FOCUS CONTROL UNIT
652b
652a
FOCUSING STATE DETECTION UNIT
STOP MEASUREMENT CONTROL UNIT
654
SHUTTER SPEED CONTROL UNIT
653
605 : IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
608
IMAGE SENSING PARAMETER STORAGE UNIT
609
OBJECT EXTRACTION MODE SETTING SWITCH
610
COMMAND DATA COMMUNICATION CONTROL UNIT
COMMAND

FIG. 37

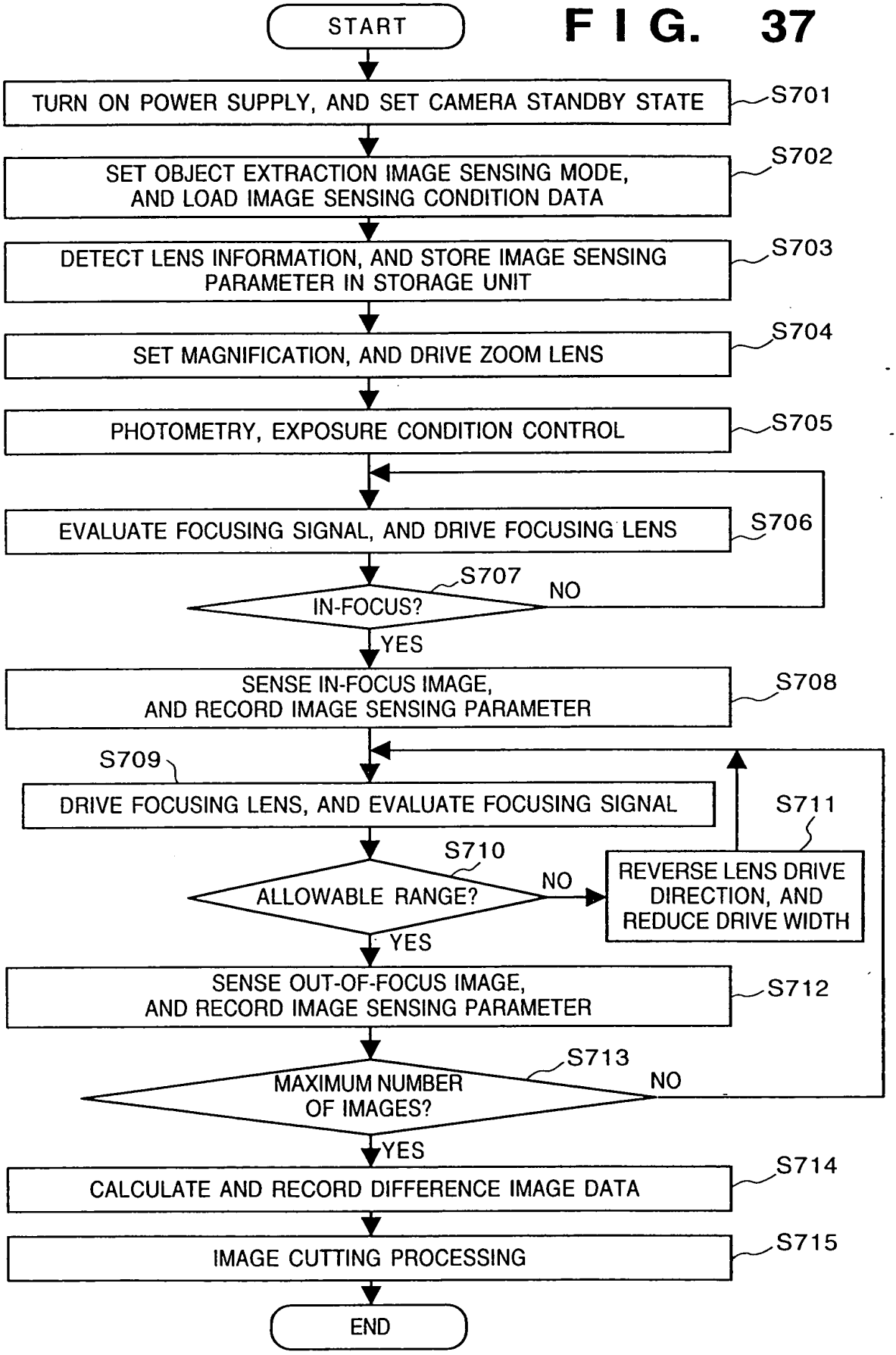

START
TURN ON POWER SUPPLY, AND SET CAMERA STANDBY STATE
S701
SET OBJECT EXTRACTION IMAGE SENSING MODE, AND LOAD IMAGE SENSING CONDITION DATA
S702
DETECT LENS INFORMATION, AND STORE IMAGE SENSING PARAMETER IN STORAGE UNIT
S703
SET MAGNIFICATION, AND DRIVE ZOOM LENS
S704
PHOTOMETRY, EXPOSURE CONDITION CONTROL
S705
EVALUATE FOCUSING SIGNAL, AND DRIVE FOCUSING LENS
S706
S707
IN-FOCUS?
NO
YES
SENSE IN-FOCUS IMAGE, AND RECORD IMAGE SENSING PARAMETER
S708
S709
DRIVE FOCUSING LENS, AND EVALUATE FOCUSING SIGNAL
S711
S710
ALLOWABLE RANGE?
NO
REVERSE LENS DRIVE DIRECTION, AND REDUCE DRIVE WIDTH
YES
SENSE OUT-OF-FOCUS IMAGE, AND RECORD IMAGE SENSING PARAMETER
S712
S713
MAXIMUM NUMBER OF IMAGES?
NO
YES
CALCULATE AND RECORD DIFFERENCE IMAGE DATA
S714
IMAGE CUTTING PROCESSING
S715
END

FIG. 38A

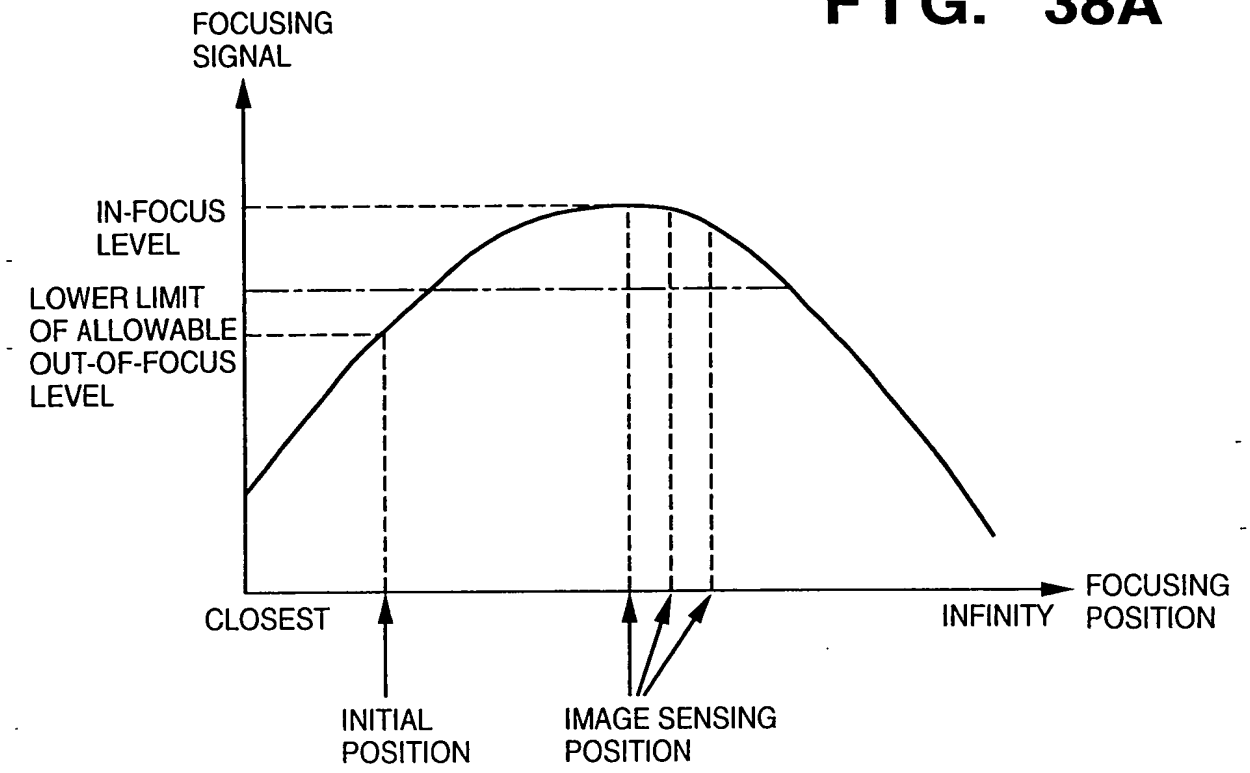


FIG. 38B

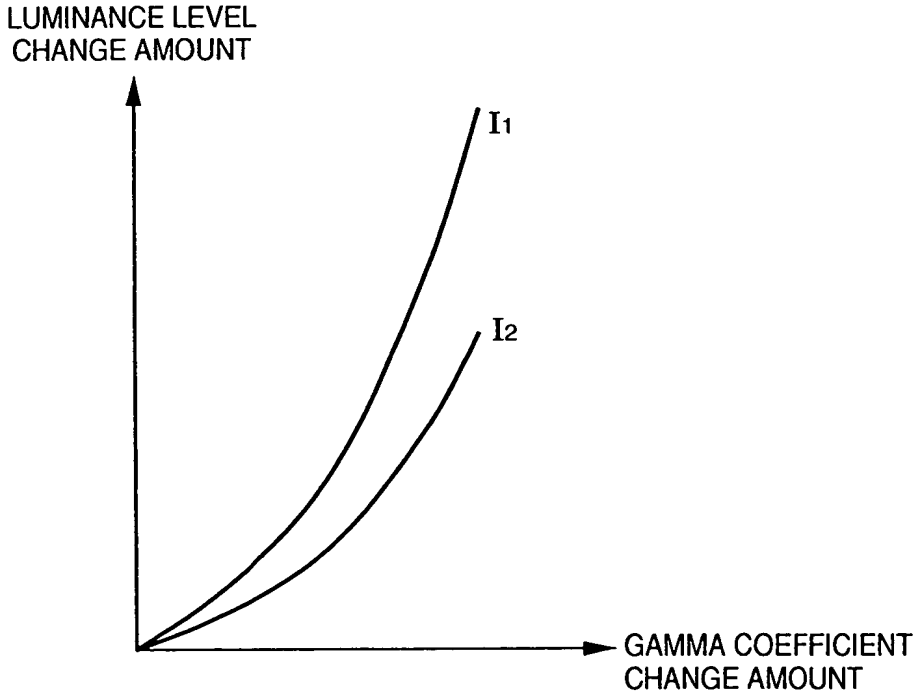


FIG. 39

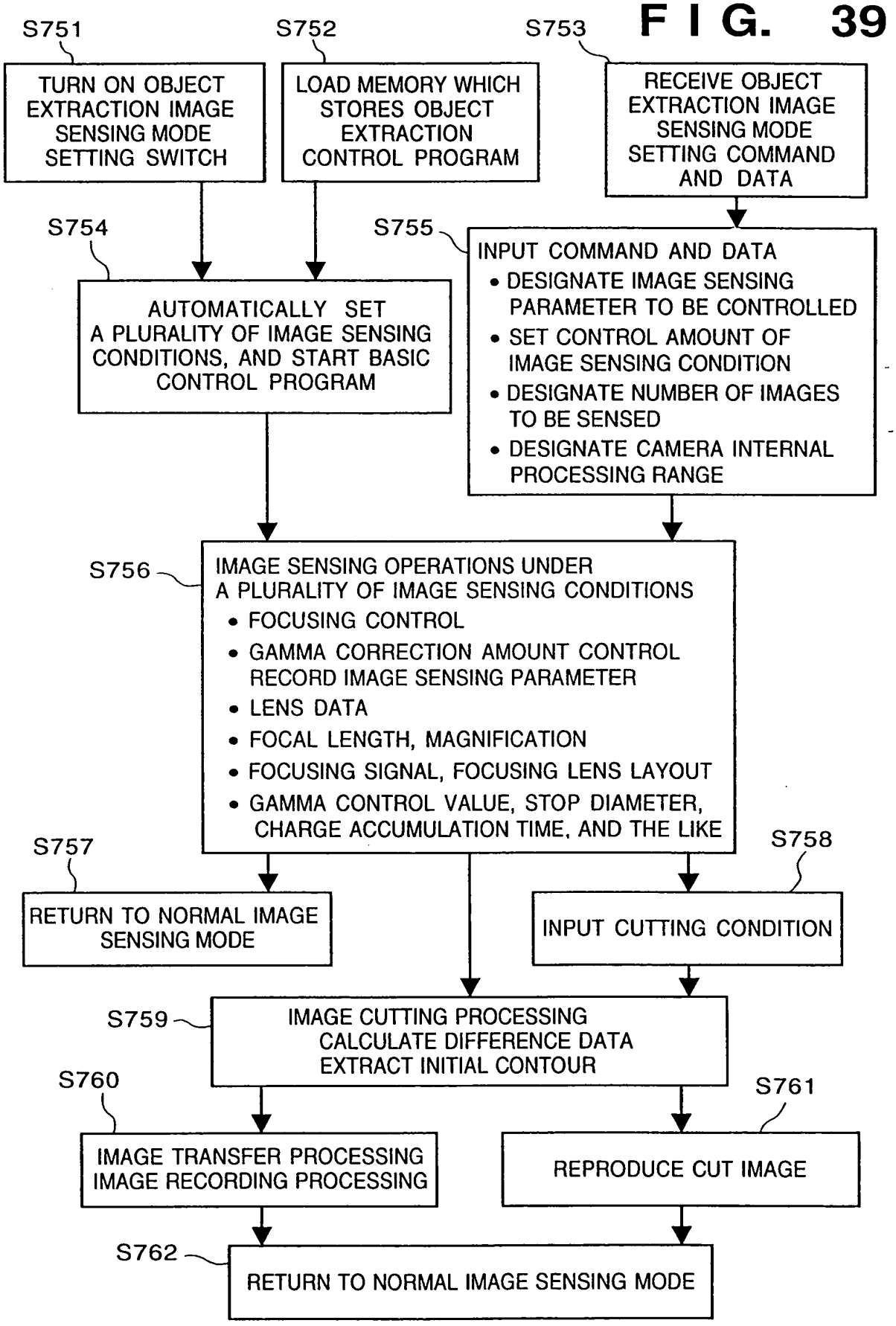

S751
TURN ON OBJECT EXTRACTION IMAGE SENSING MODE SETTING SWITCH
S752
LOAD MEMORY WHICH STORES OBJECT EXTRACTION CONTROL PROGRAM
S753
RECEIVE OBJECT EXTRACTION IMAGE SENSING MODE SETTING COMMAND AND DATA
S754
AUTOMATICALLY SET A PLURALITY OF IMAGE SENSING CONDITIONS, AND START BASIC CONTROL PROGRAM
S755
INPUT COMMAND AND DATA
• DESIGNATE IMAGE SENSING PARAMETER TO BE CONTROLLED
• SET CONTROL AMOUNT OF IMAGE SENSING CONDITION
• DESIGNATE NUMBER OF IMAGES TO BE SENSED
• DESIGNATE CAMERA INTERNAL PROCESSING RANGE
S756
IMAGE SENSING OPERATIONS UNDER A PLURALITY OF IMAGE SENSING CONDITIONS
• FOCUSING CONTROL
• GAMMA CORRECTION AMOUNT CONTROL RECORD IMAGE SENSING PARAMETER
• LENS DATA
• FOCAL LENGTH, MAGNIFICATION
• FOCUSING SIGNAL, FOCUSING LENS LAYOUT
• GAMMA CONTROL VALUE, STOP DIAMETER, CHARGE ACCUMULATION TIME, AND THE LIKE
S757
RETURN TO NORMAL IMAGE SENSING MODE
S758
INPUT CUTTING CONDITION
S759
IMAGE CUTTING PROCESSING
CALCULATE DIFFERENCE DATA
EXTRACT INITIAL CONTOUR
S760
IMAGE TRANSFER PROCESSING
IMAGE RECORDING PROCESSING
S761
REPRODUCE CUT IMAGE
S762
RETURN TO NORMAL IMAGE SENSING MODE

FIG. 40

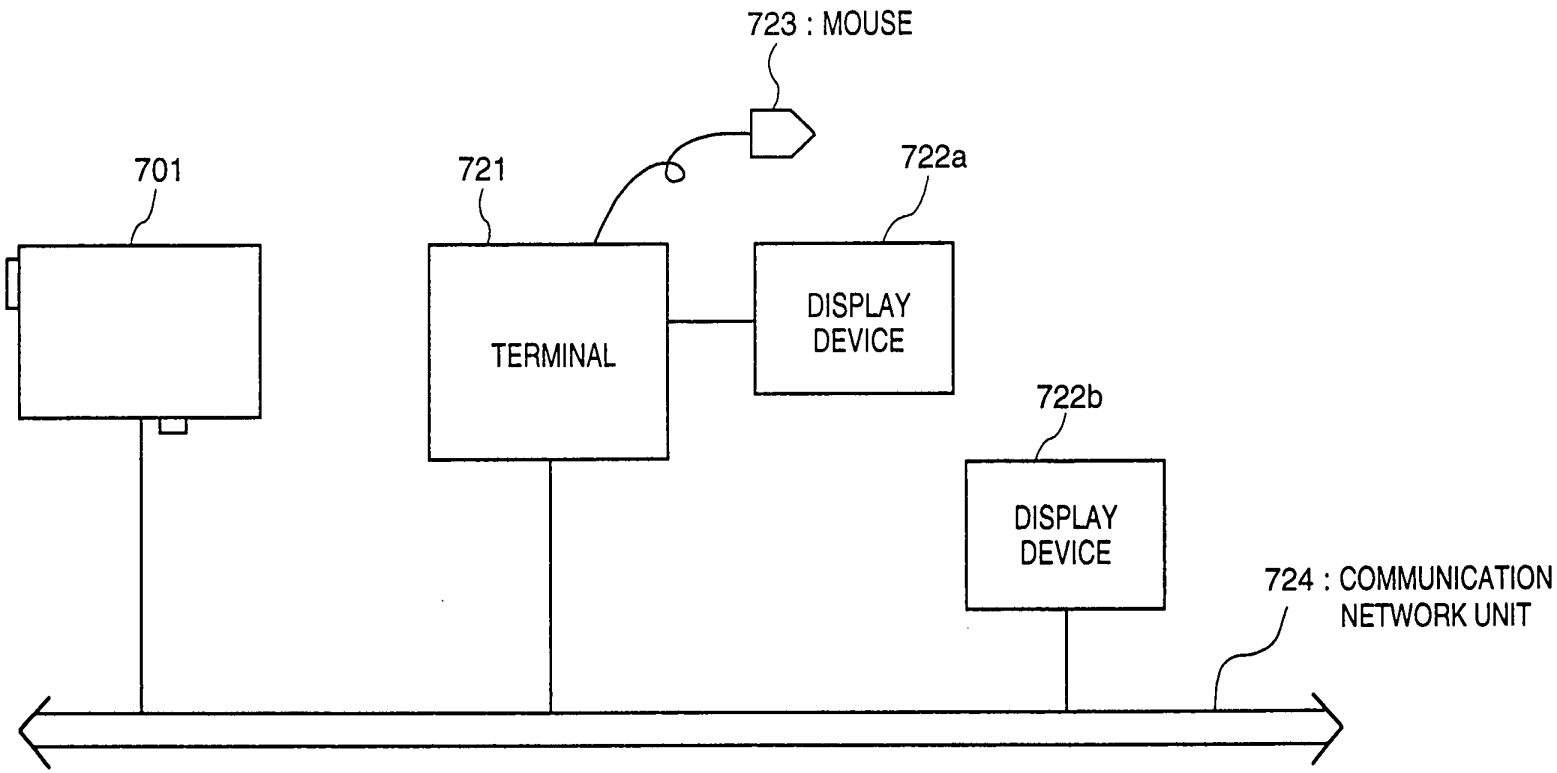

723 : MOUSE
701
721
722a
TERMINAL
DISPLAY DEVICE
722b
DISPLAY DEVICE
724 : COMMUNICATION NETWORK UNIT

FIG. 41

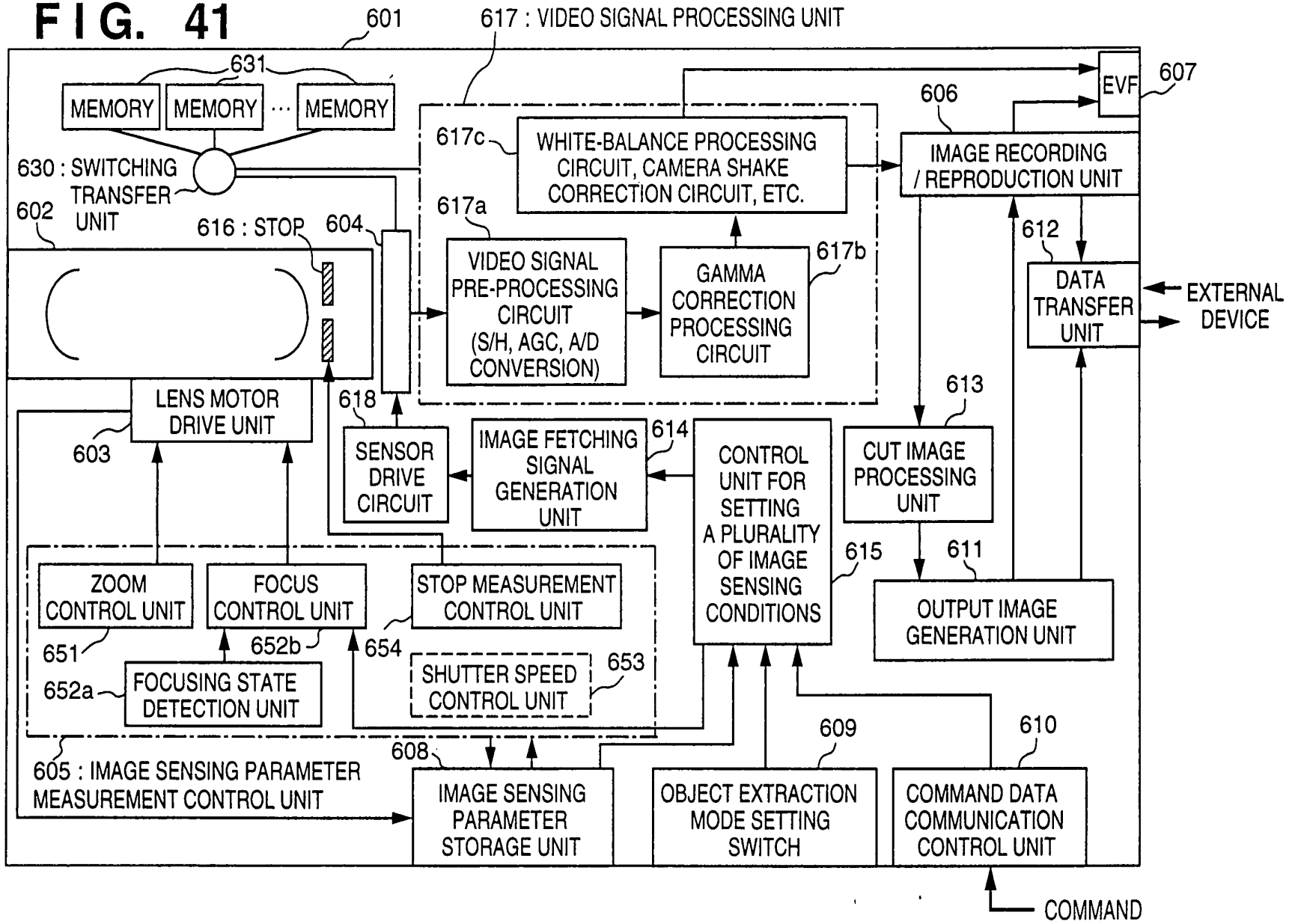

601
617 : VIDEO SIGNAL PROCESSING UNIT
631
MEMORY
MEMORY
MEMORY
630 : SWITCHING TRANSFER UNIT
602
616 : STOP
604
617c
WHITE-BALANCE PROCESSING CIRCUIT, CAMERA SHAKE CORRECTION CIRCUIT, ETC.
617a
VIDEO SIGNAL PRE-PROCESSING CIRCUIT (S/H, AGC, A/D CONVERSION)
GAMMA CORRECTION PROCESSING CIRCUIT
617b
606
EVF
607
IMAGE RECORDING / REPRODUCTION UNIT
612
DATA TRANSFER UNIT
EXTERNAL DEVICE
LENS MOTOR DRIVE UNIT
603
618
SENSOR DRIVE CIRCUIT
IMAGE FETCHING SIGNAL GENERATION UNIT
614
CONTROL UNIT FOR SETTING A PLURALITY OF IMAGE SENSING CONDITIONS
615
613
CUT IMAGE PROCESSING UNIT
611
OUTPUT IMAGE GENERATION UNIT
ZOOM CONTROL UNIT
651
FOCUS CONTROL UNIT
652b
652a
FOCUSING STATE DETECTION UNIT
STOP MEASUREMENT CONTROL UNIT
654
SHUTTER SPEED CONTROL UNIT
653
605 : IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
608
IMAGE SENSING PARAMETER STORAGE UNIT
609
OBJECT EXTRACTION MODE SETTING SWITCH
610
COMMAND DATA COMMUNICATION CONTROL UNIT
COMMAND

FIG. 42

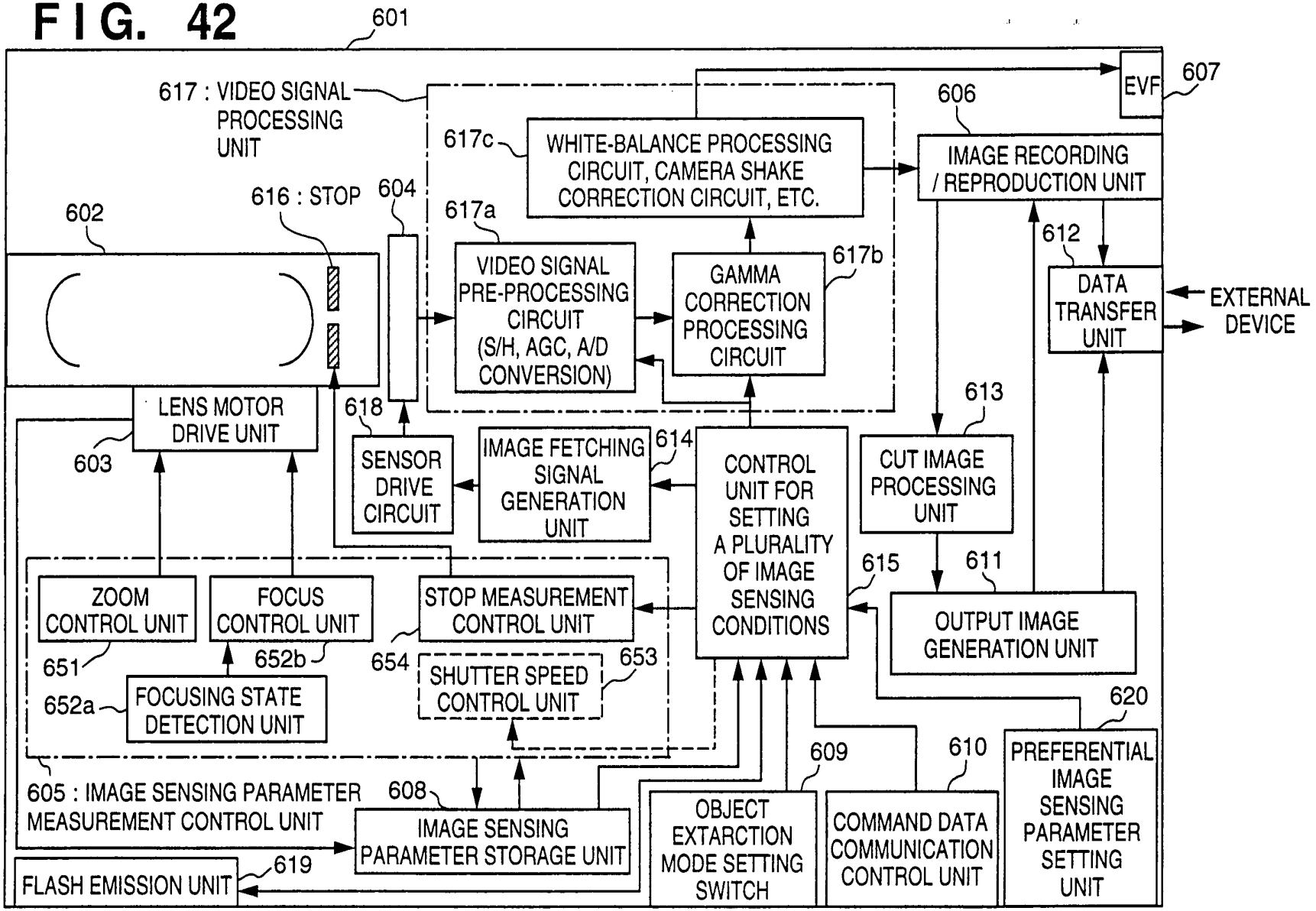

601
617 : VIDEO SIGNAL PROCESSING UNIT
EVF
607
606
617c
WHITE-BALANCE PROCESSING CIRCUIT, CAMERA SHAKE CORRECTION CIRCUIT, ETC.
IMAGE RECORDING / REPRODUCTION UNIT
616 : STOP
604
602
617a
612
VIDEO SIGNAL PRE-PROCESSING CIRCUIT (S/H, AGC, A/D CONVERSION)
GAMMA CORRECTION PROCESSING CIRCUIT
617b
DATA TRANSFER UNIT
EXTERNAL DEVICE
LENS MOTOR DRIVE UNIT
618
613
603
SENSOR DRIVE CIRCUIT
IMAGE FETCHING SIGNAL GENERATION UNIT
614
CONTROL UNIT FOR SETTING A PLURALITY OF IMAGE SENSING CONDITIONS
CUT IMAGE PROCESSING UNIT
615
611
ZOOM CONTROL UNIT
FOCUS CONTROL UNIT
STOP MEASUREMENT CONTROL UNIT
OUTPUT IMAGE GENERATION UNIT
651
652b
654
653
SHUTTER SPEED CONTROL UNIT
652a
FOCUSING STATE DETECTION UNIT
620
605 : IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
608
609
610
PREFERENTIAL IMAGE SENSING PARAMETER SETTING UNIT
IMAGE SENSING PARAMETER STORAGE UNIT
OBJECT EXTARCTION MODE SETTING SWITCH
COMMAND DATA COMMUNICATION CONTROL UNIT
619
FLASH EMISSION UNIT

FIG. 43

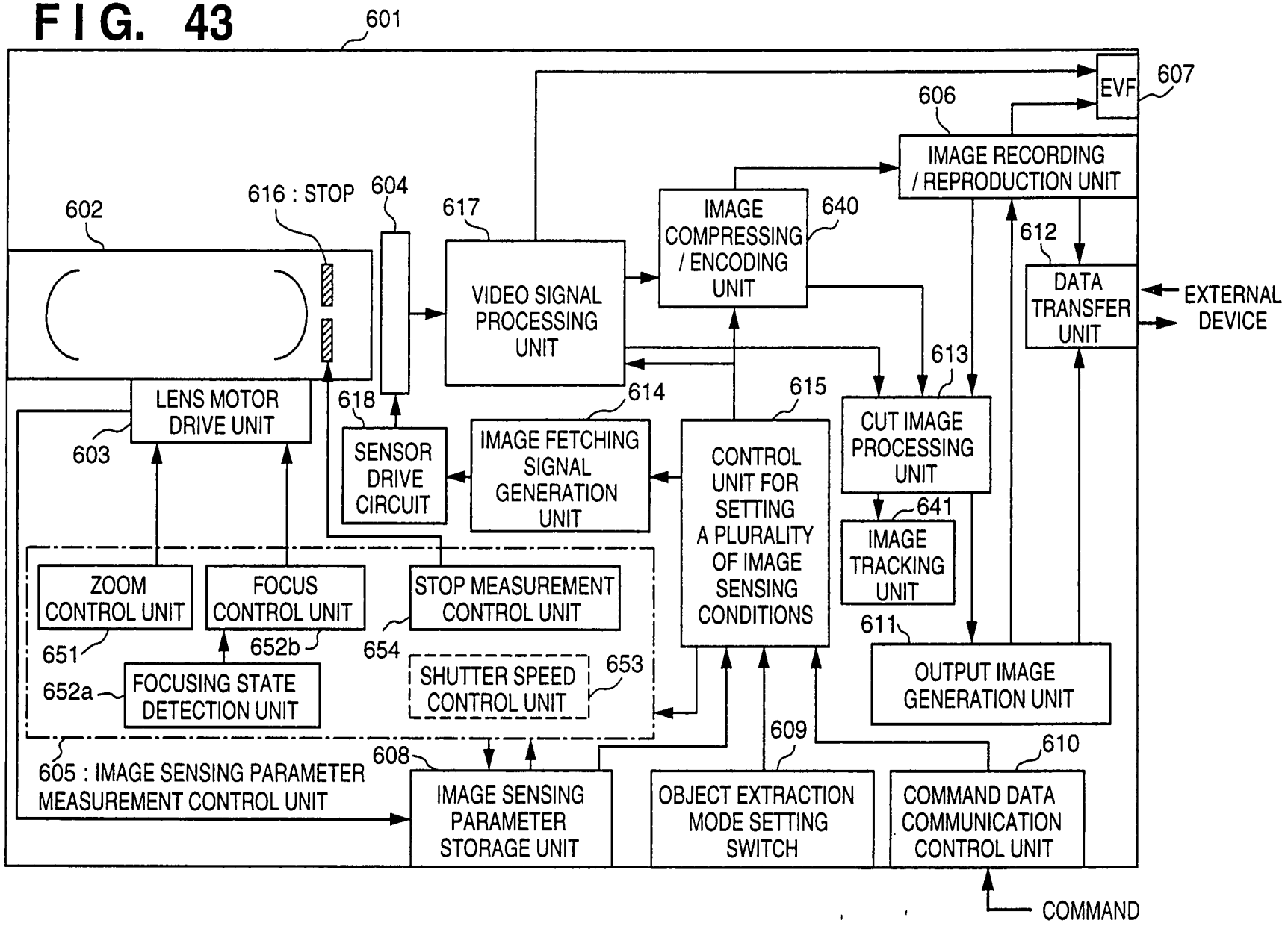

601
EVF
607
606
IMAGE RECORDING / REPRODUCTION UNIT
616 : STOP
604
602
617
IMAGE COMPRESSING / ENCODING UNIT
640
612
VIDEO SIGNAL PROCESSING UNIT
DATA TRANSFER UNIT
EXTERNAL DEVICE
613
LENS MOTOR DRIVE UNIT
618
614
615
CUT IMAGE PROCESSING UNIT
603
SENSOR DRIVE CIRCUIT
IMAGE FETCHING SIGNAL GENERATION UNIT
CONTROL UNIT FOR SETTING A PLURALITY OF IMAGE SENSING CONDITIONS
641
IMAGE TRACKING UNIT
ZOOM CONTROL UNIT
FOCUS CONTROL UNIT
STOP MEASUREMENT CONTROL UNIT
611
651
652b
654
OUTPUT IMAGE GENERATION UNIT
652a
FOCUSING STATE DETECTION UNIT
SHUTTER SPEED CONTROL UNIT
653
609
610
608
605 : IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
IMAGE SENSING PARAMETER STORAGE UNIT
OBJECT EXTRACTION MODE SETTING SWITCH
COMMAND DATA COMMUNICATION CONTROL UNIT
COMMAND

FIG. 44

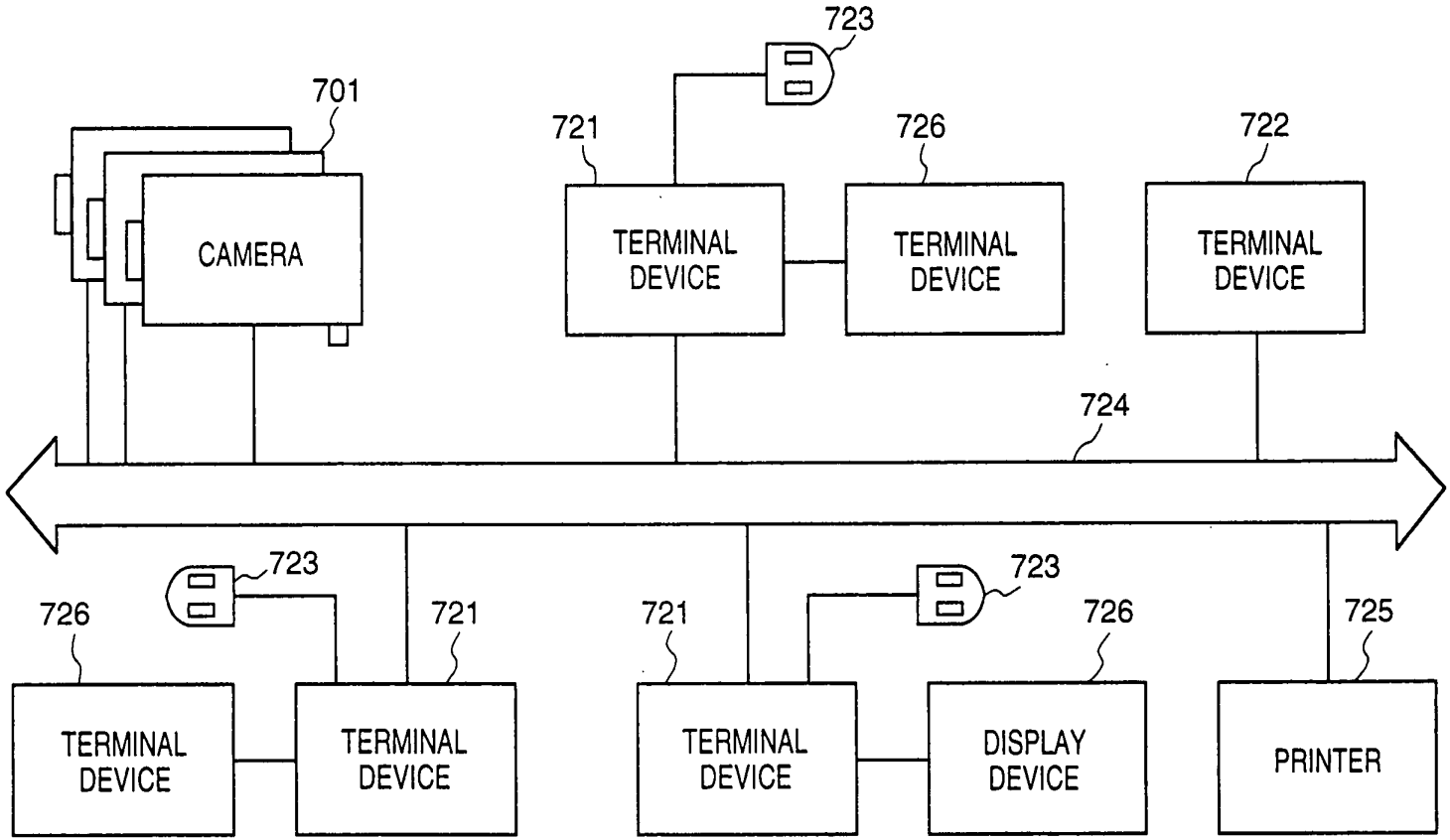

723
701
721
726
722
CAMERA
TERMINAL DEVICE
TERMINAL DEVICE
TERMINAL DEVICE
724
723
723
726
721
721
726
725
TERMINAL DEVICE
TERMINAL DEVICE
TERMINAL DEVICE
DISPLAY DEVICE
PRINTER

FIG. 45

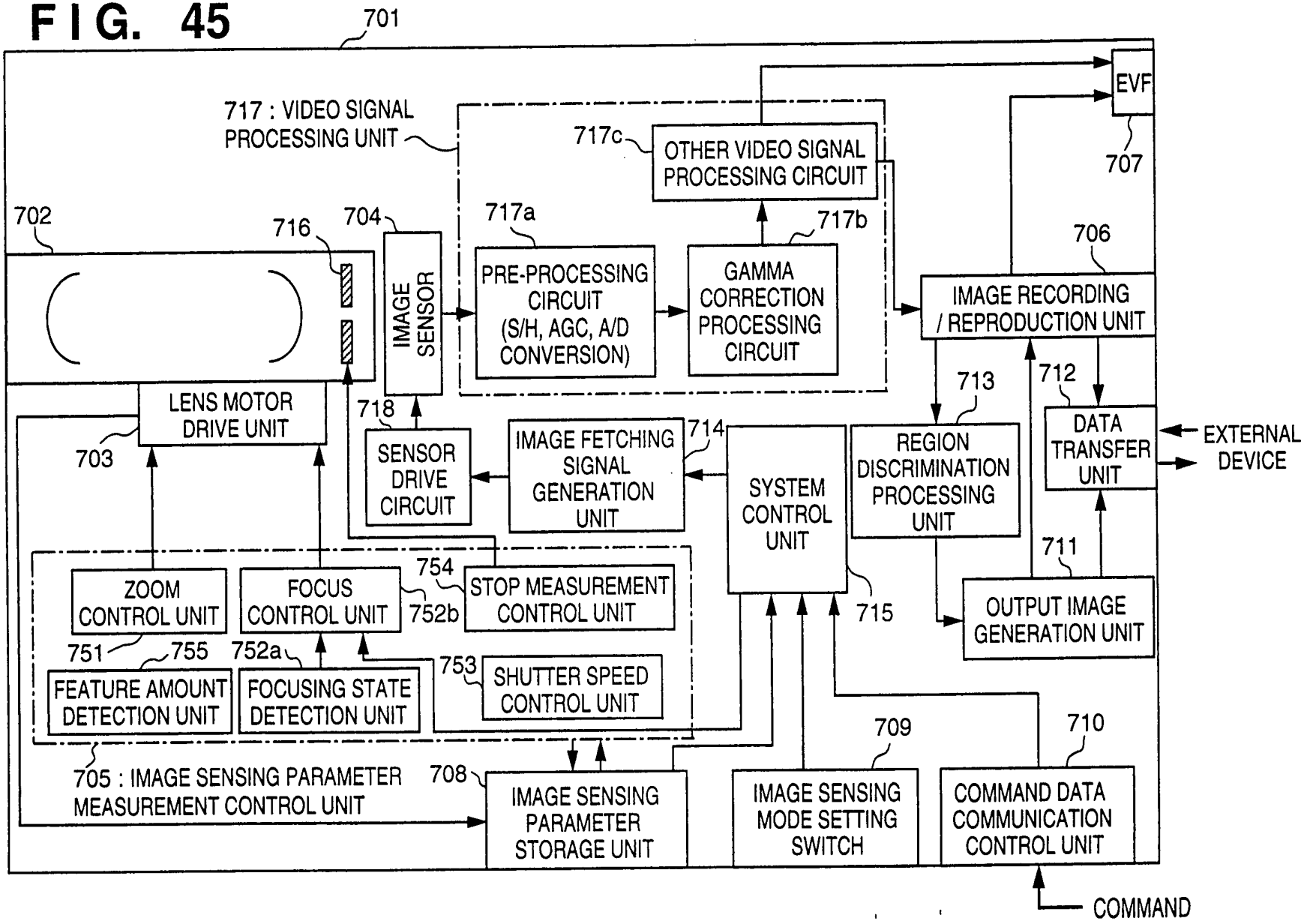

701
717 : VIDEO SIGNAL PROCESSING UNIT
717c
OTHER VIDEO SIGNAL PROCESSING CIRCUIT
EVF
707
702
716
704
IMAGE SENSOR
717a
PRE-PROCESSING CIRCUIT (S/H, AGC, A/D CONVERSION)
GAMMA CORRECTION PROCESSING CIRCUIT
717b
706
IMAGE RECORDING / REPRODUCTION UNIT
713
712
LENS MOTOR DRIVE UNIT
703
718
SENSOR DRIVE CIRCUIT
IMAGE FETCHING SIGNAL GENERATION UNIT
714
SYSTEM CONTROL UNIT
REGION DISCRIMINATION PROCESSING UNIT
DATA TRANSFER UNIT
EXTERNAL DEVICE
711
754
ZOOM CONTROL UNIT
FOCUS CONTROL UNIT
752b
STOP MEASUREMENT CONTROL UNIT
715
OUTPUT IMAGE GENERATION UNIT
751
755
752a
753
FEATURE AMOUNT DETECTION UNIT
FOCUSING STATE DETECTION UNIT
SHUTTER SPEED CONTROL UNIT
709
710
705 : IMAGE SENSING PARAMETER MEASUREMENT CONTROL UNIT
708
IMAGE SENSING PARAMETER STORAGE UNIT
IMAGE SENSING MODE SETTING SWITCH
COMMAND DATA COMMUNICATION CONTROL UNIT
COMMAND

FIG. 46

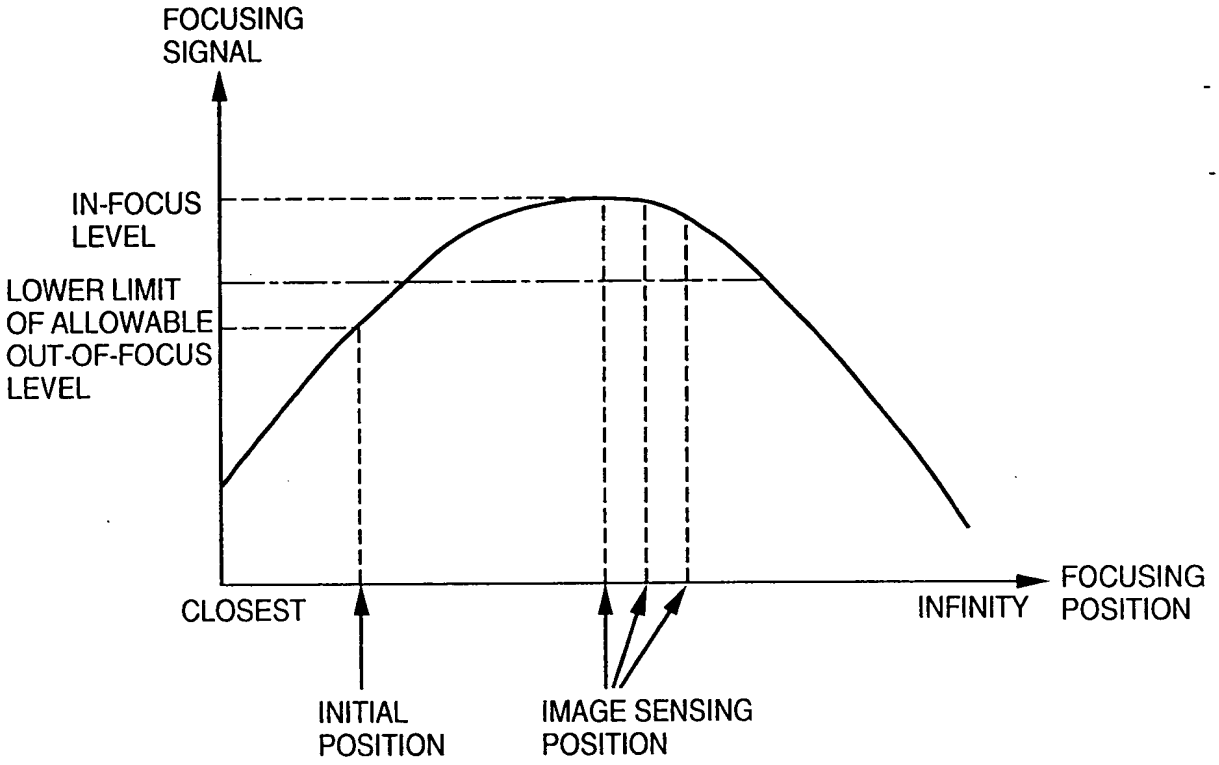

FOCUSING SIGNAL
IN-FOCUS LEVEL
LOWER LIMIT OF ALLOWABLE OUT-OF-FOCUS LEVEL
CLOSEST
INFINITY
FOCUSING POSITION
INITIAL POSITION
IMAGE SENSING POSITION

FIG. 47

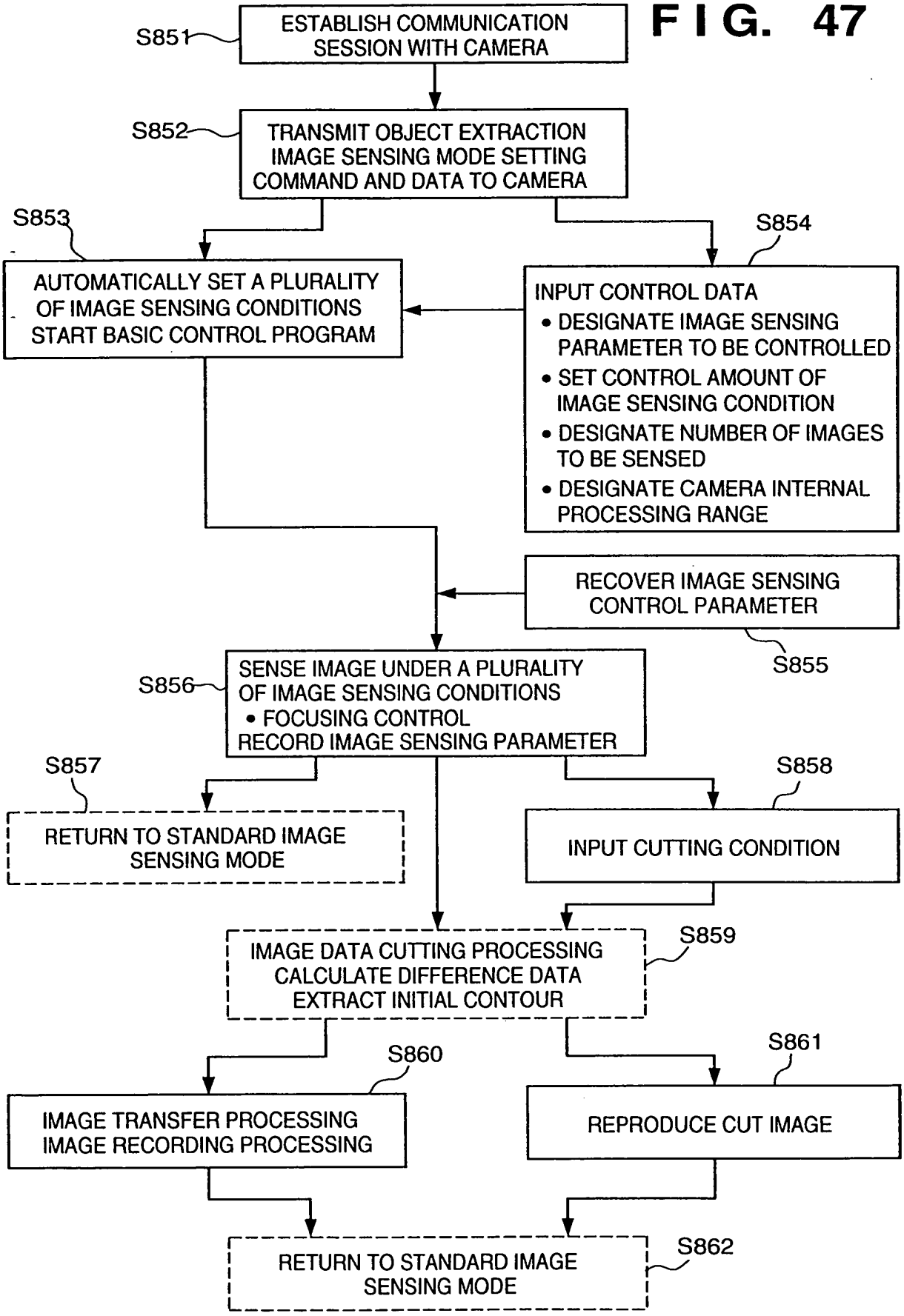

S851
ESTABLISH COMMUNICATION SESSION WITH CAMERA
S852
TRANSMIT OBJECT EXTRACTION IMAGE SENSING MODE SETTING COMMAND AND DATA TO CAMERA
S853
AUTOMATICALLY SET A PLURALITY OF IMAGE SENSING CONDITIONS START BASIC CONTROL PROGRAM
S854
INPUT CONTROL DATA
• DESIGNATE IMAGE SENSING PARAMETER TO BE CONTROLLED
• SET CONTROL AMOUNT OF IMAGE SENSING CONDITION
• DESIGNATE NUMBER OF IMAGES TO BE SENSED
• DESIGNATE CAMERA INTERNAL PROCESSING RANGE
RECOVER IMAGE SENSING CONTROL PARAMETER
S855
S856
SENSE IMAGE UNDER A PLURALITY OF IMAGE SENSING CONDITIONS
• FOCUSING CONTROL
RECORD IMAGE SENSING PARAMETER
S857
RETURN TO STANDARD IMAGE SENSING MODE
S858
INPUT CUTTING CONDITION
S859
IMAGE DATA CUTTING PROCESSING
CALCULATE DIFFERENCE DATA
EXTRACT INITIAL CONTOUR
S860
IMAGE TRANSFER PROCESSING
IMAGE RECORDING PROCESSING
S861
REPRODUCE CUT IMAGE
S862
RETURN TO STANDARD IMAGE SENSING MODE

FIG. 48A

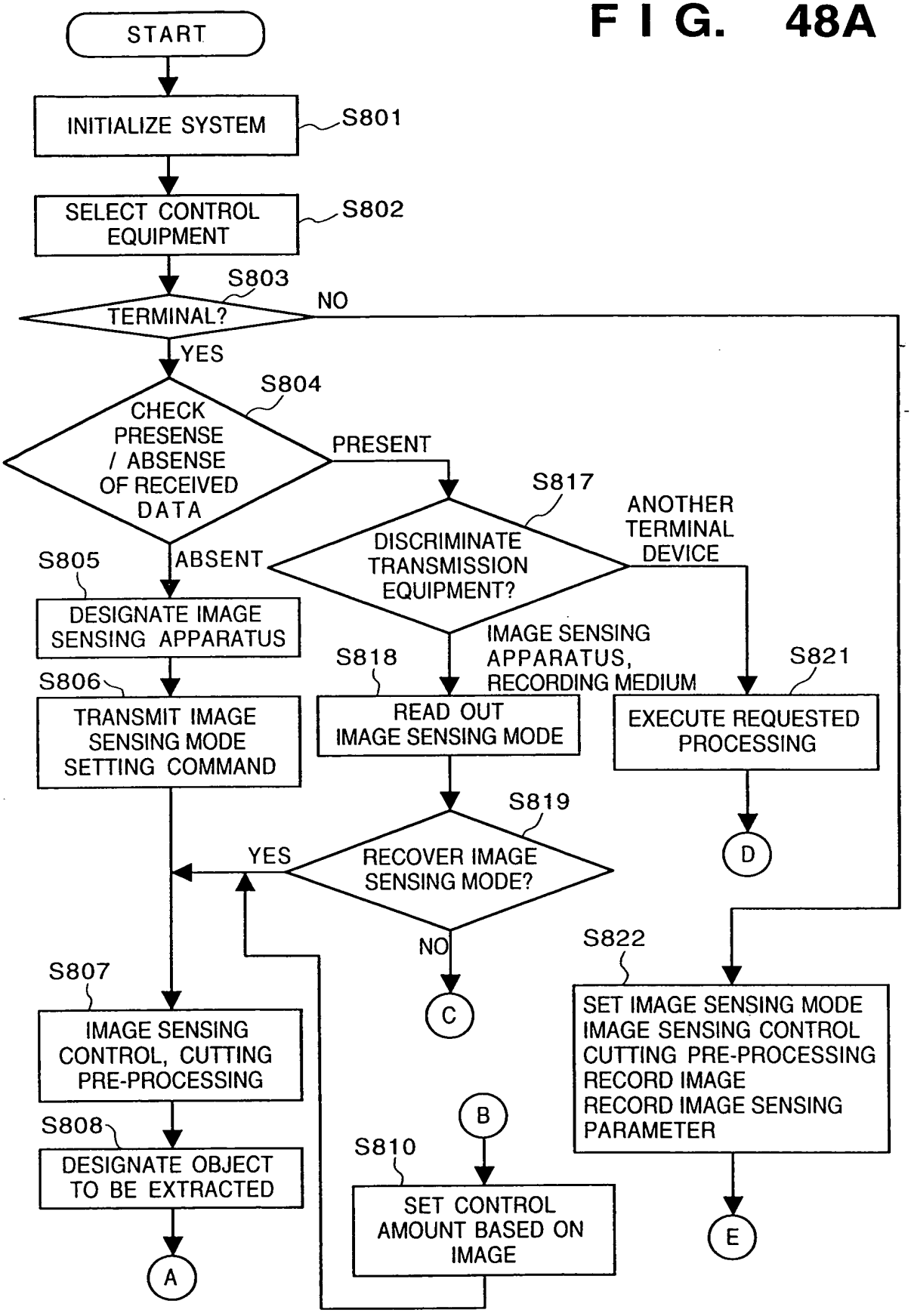

START
INITIALIZE SYSTEM
S801
SELECT CONTROL EQUIPMENT
S802
S803
TERMINAL?
NO
YES
S804
CHECK PRESENSE / ABSENSE OF RECEIVED DATA
PRESENT
ABSENT
S805
DESIGNATE IMAGE SENSING APPARATUS
S806
TRANSMIT IMAGE SENSING MODE SETTING COMMAND
S807
IMAGE SENSING CONTROL, CUTTING PRE-PROCESSING
S808
DESIGNATE OBJECT TO BE EXTRACTED
A
S817
DISCRIMINATE TRANSMISSION EQUIPMENT?
ANOTHER TERMINAL DEVICE
IMAGE SENSING APPARATUS, RECORDING MEDIUM
S818
READ OUT IMAGE SENSING MODE
S819
RECOVER IMAGE SENSING MODE?
YES
NO
C
B
S810
SET CONTROL AMOUNT BASED ON IMAGE
S821
EXECUTE REQUESTED PROCESSING
D
S822
SET IMAGE SENSING MODE
IMAGE SENSING CONTROL
CUTTING PRE-PROCESSING
RECORD IMAGE
RECORD IMAGE SENSING PARAMETER
E

FIG. 48B

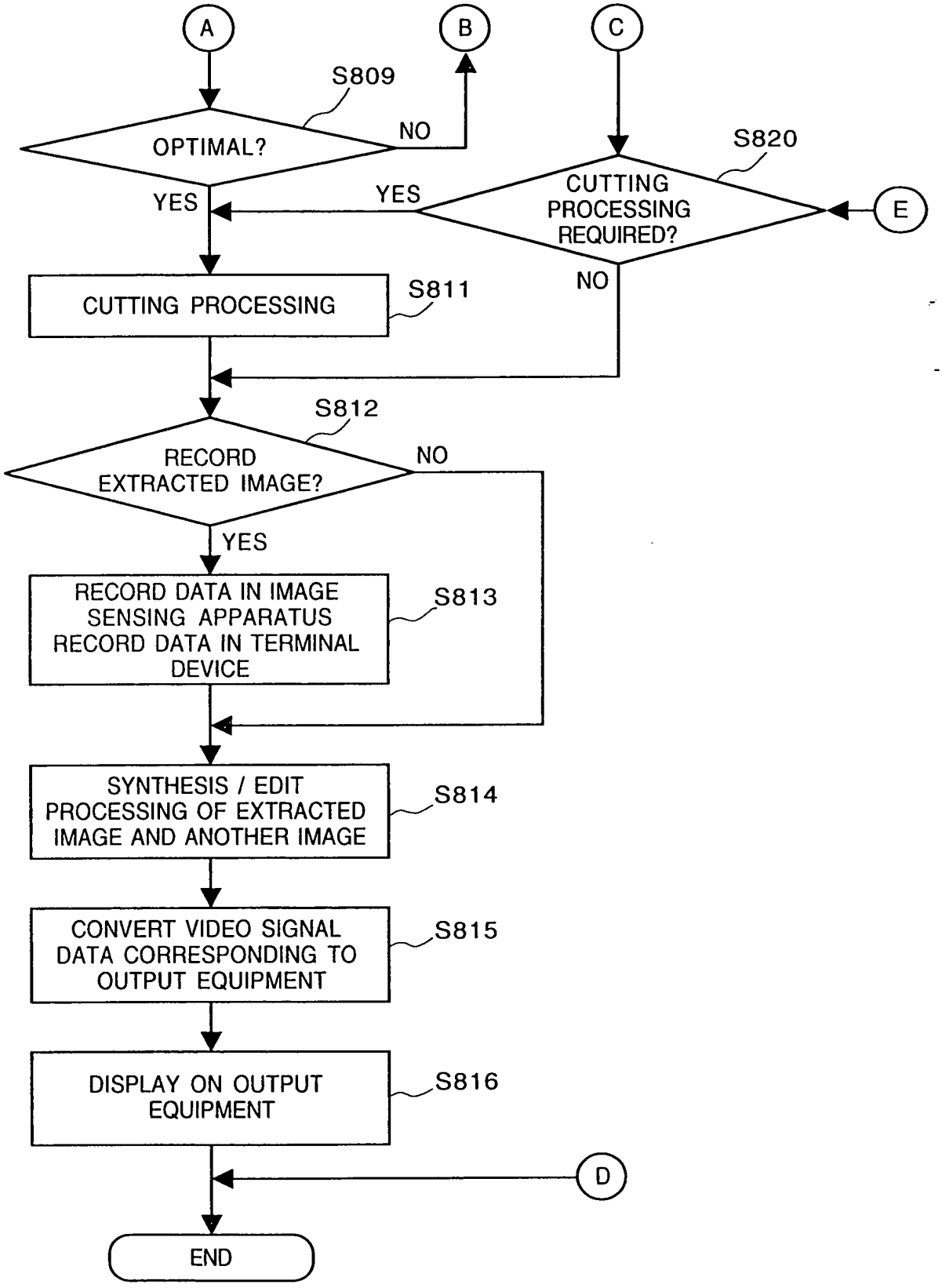

A
B
C
S809
OPTIMAL?
NO
YES
S820
CUTTING PROCESSING REQUIRED?
YES
E
NO
CUTTING PROCESSING
S811
S812
RECORD EXTRACTED IMAGE?
NO
YES
RECORD DATA IN IMAGE SENSING APPARATUS RECORD DATA IN TERMINAL DEVICE
S813
SYNTHESIS / EDIT PROCESSING OF EXTRACTED IMAGE AND ANOTHER IMAGE
S814
CONVERT VIDEO SIGNAL DATA CORRESPONDING TO OUTPUT EQUIPMENT
S815
DISPLAY ON OUTPUT EQUIPMENT
S816
D
END

FIG. 49

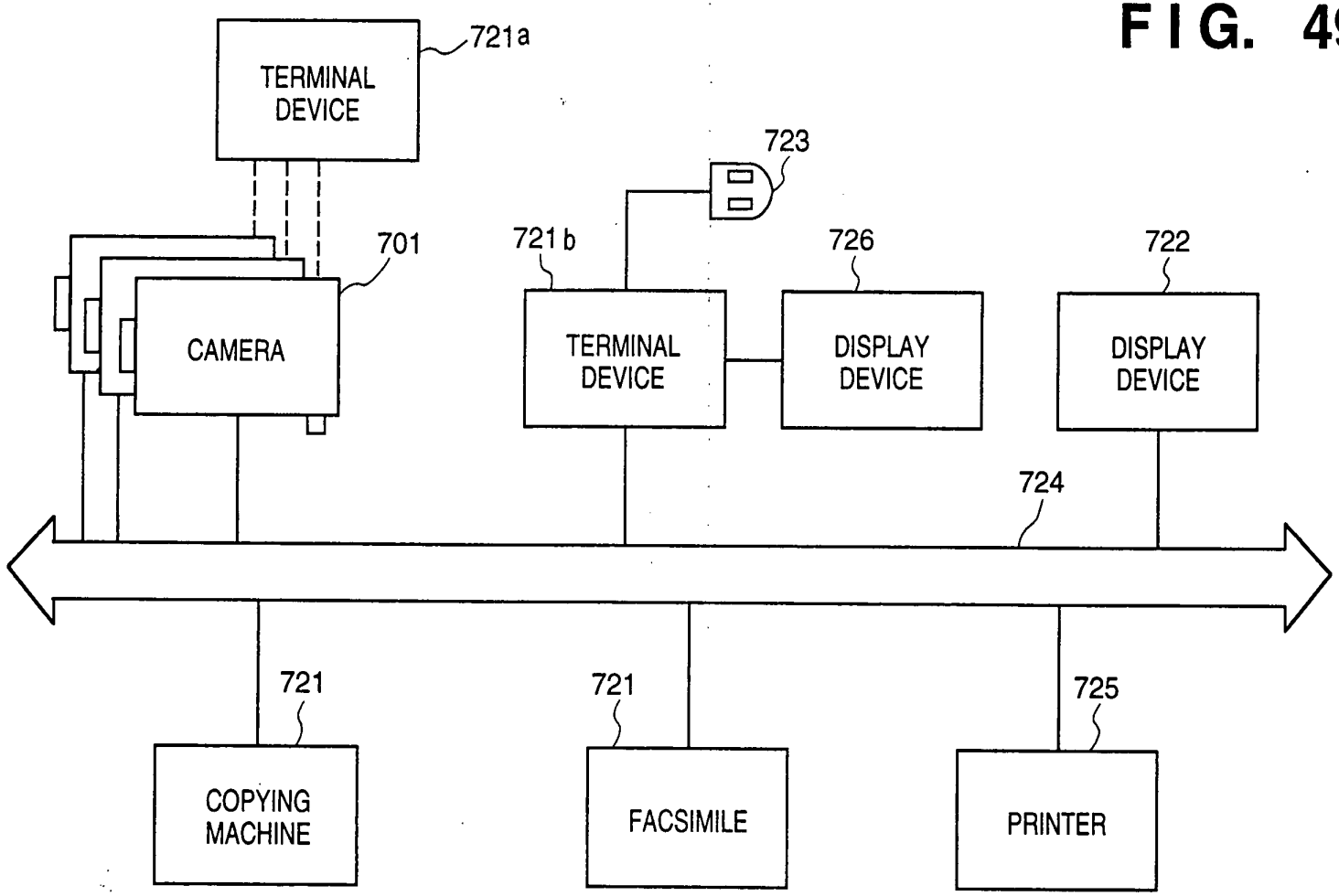
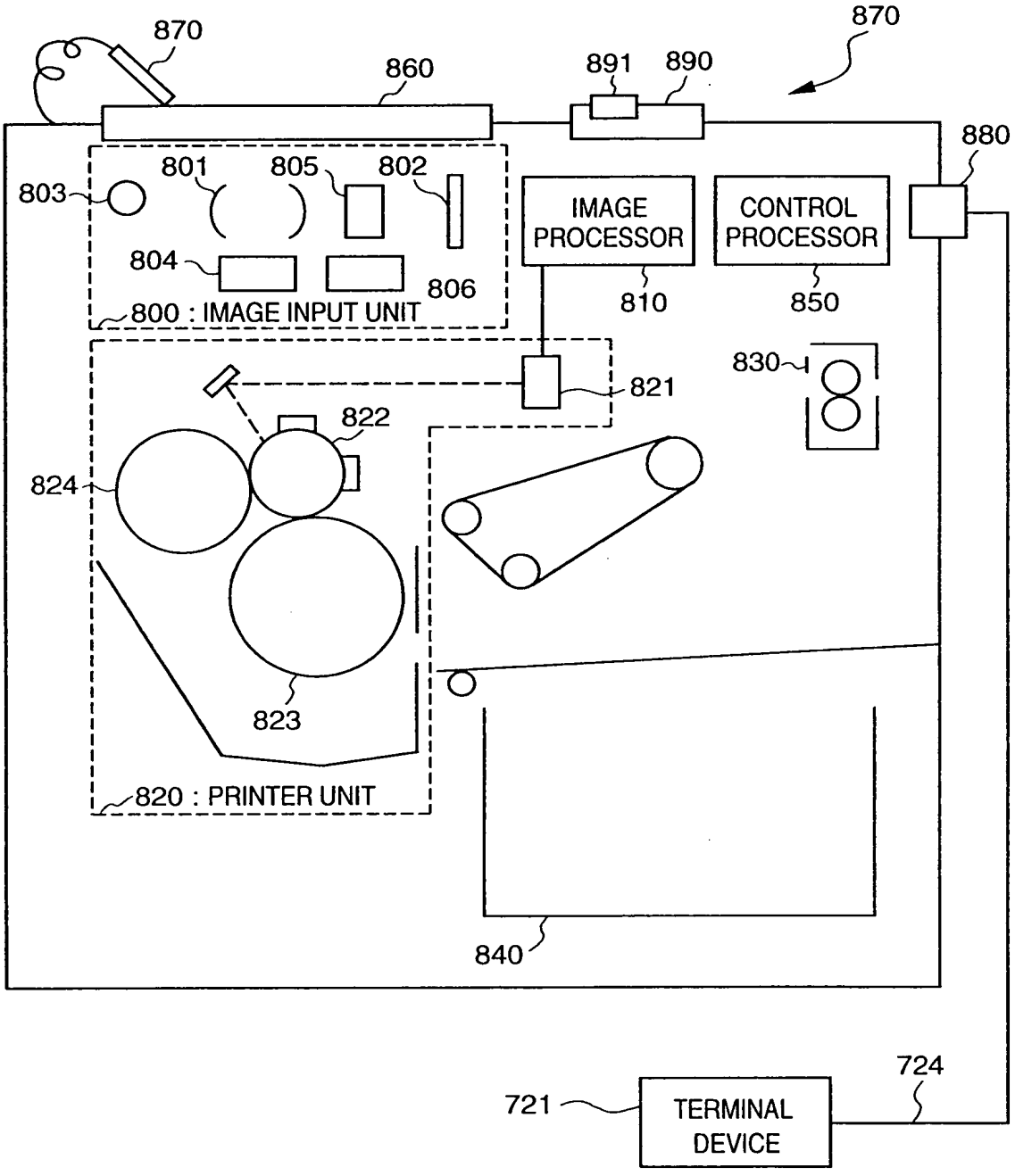

TERMINAL DEVICE
721a
723
701
721b
726
722
CAMERA
TERMINAL DEVICE
DISPLAY DEVICE
DISPLAY DEVICE
724
721
721
725
COPYING MACHINE
FACSIMILE
PRINTER

FIG. 50


870
870
860
891
890
880
801
805
802
803
IMAGE PROCESSOR
CONTROL PROCESSOR
804
806
800 : IMAGE INPUT UNIT
810
850
830
821
822
824
823
820 : PRINTER UNIT
840
724
721
TERMINAL DEVICE

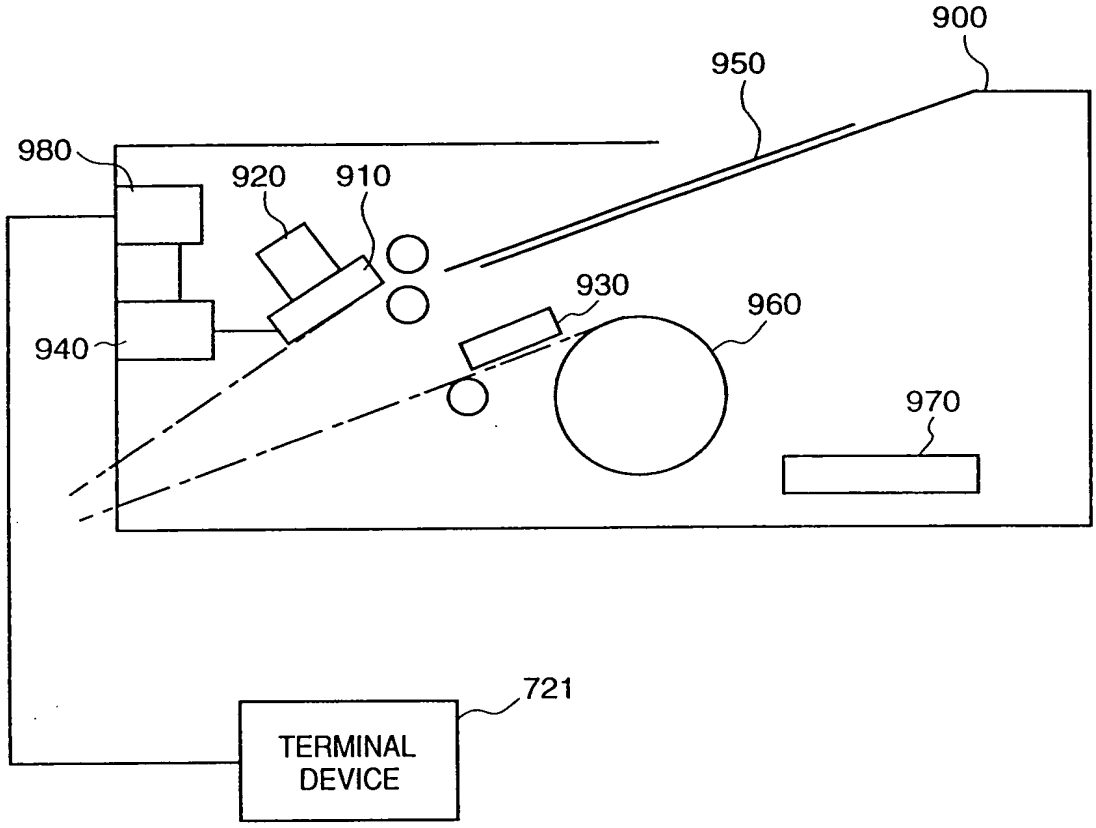



FIG. 51